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INTRODUCTION.

This REVIEW is based on reports for January, 1892, from 2,649 regular and voluntary observers. These reports are classified as follows: 157 reports from Weather Bureau stations; 103 reports from United States Army post surgeons; 1,736 monthly reports from state weather service and voluntary observers; 31 reports from Canadian stations; 217 reports through the Cen-

tral Pacific Railway Company; 405 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Service;" monthly reports from local weather services established in all states and territories, except Idaho, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR JANUARY, 1892.

The month was colder than usual in the east-central and southeastern districts and over the interior of the middle and southern plateau regions, the most marked departure below the average temperature for January being noted from Lower Michigan to the Gulf of Mexico, where it was more than 4° . Over the extreme northeastern and northern districts, from the southeastern slope of the Rocky Mountains over the British Northwest Territory, and in the Pacific coast states the mean temperature was above the normal, the greatest excess appearing on the northeastern slope of the Rocky Mountains, where it was 5° to 10° .

Nine warm and seven cold waves advanced over districts east of the Rocky Mountains. Two of the warm waves were especially noteworthy. One appeared over Alberta on the 18th and advanced thence to the Atlantic coast by the 21st, and the other moved from the north Pacific coast to the Alleghany Mountains from the 29th to 31st. During the 19th the temperature rise was more than 50° over Montana, and a rise of 69° in six hours was reported at Glendive, Mont. The warm wave of the 29th-31st was attended by the highest temperature on record for January at points on the northeastern and middle-eastern slopes of the Rocky Mountains. The principal cold wave of the month appeared in the Northwest on the 16th, and reached the Atlantic coast the night of the 19-20th. Attending this cold wave the temperature fell 40° to 50° below zero in eastern Montana and North Dakota, and the line of zero temperature extended to northern Texas. Cold weather caused loss of stock on the ranges, from Kansas to Texas, and vegetation on the west Gulf coast was killed by heavy frost. Heavy frost occurred as far south as Jupiter, Fla., the early part of the month.

PRECIPITATION.

The monthly precipitation was generally in excess of the January average in the Atlantic and east Gulf states, in a strip extending from the upper lake region to Missouri, and from the middle-eastern slope of the Rocky Mountains over the southern plateau region, the greatest excess being noted in the interior of the east Gulf states, where it was 5.00 to 13.00 inches. From the Pacific coast over the northern part of the plateau region, generally in the central valleys, and at stations along the immediate Atlantic coast from southern

New England to the Carolinas the monthly precipitation was deficient, the most marked deficiency occurring on the north Pacific coast and at Hatteras, N. C., where it exceeded 4.00 inches.

The heavy rains of the middle part of the month caused high water in the streams of the eastern and southeastern states, and in the Ohio, Tennessee, and Cumberland rivers and tributaries. Monthly snowfall of 50 inches, or more, was reported in the mountains of California and Idaho, and at Flagstaff, Ariz., Atlantic, Mich., and Constableville, N. Y.; and the snowfall exceeded 20 inches over a great part of the Lake region, and in the mountains of Colorado and Oregon. At the close of the month more than 10 inches was reported on the ground in northern New England, northern, central, and western New York, east-central Lower Michigan, northern Upper Michigan, eastern North Dakota, and from central Utah and northern Nevada over the northern plateau region. On the 21st the Rio Grande frontier of Texas was reported covered with snow.

STORMS.

On the 5th severe local storms occurred in the east Gulf and south Atlantic states. During the passage of a tornado over Fayetteville, Ga., 3 persons were killed, a number were injured, and property was destroyed to the value of \$30,000 to \$50,000. In Darlington county, S. C., several persons were injured, and a number of buildings were demolished by a tornado. Severe local storms occurred in Georgia and Florida on the 6th. At Oakland, Fla., a tornado caused considerable damage, and one person was killed by a falling building. On this date a heavy snowstorm, with high winds, prevailed over the middle Atlantic and New England states. From the 11th to 14th an exceptionally heavy rain and sleet storm extended from the east Gulf states over the Ohio Valley, the lower lake region, and the middle Atlantic and New England states, the precipitation assuming the form of snow in the more northern districts.

ICE IN RIVERS.

The upper Mississippi and middle and upper Missouri rivers were frozen throughout the month. The Mississippi River was frozen over at Saint Louis, Mo., and at points thence southward to Cairo, Ill., during a great part of the last half of the

month. The Detroit River was frozen over at Detroit, Mich., on the 15th. The Saint Clair River was frozen from Fort Gratiot, Mich., to Point Edward, Canada, on the 12th, and was frozen over at Port Huron, Mich., on the 27th. Navigation on the Ohio River was interrupted by floating ice.

AURORAS.

On the 5th auroras were reported over the northern part of the country from Washington to New England, and southward to Oklahoma Territory. Auroras were reported in the north-central and northeastern states on the 29th and 30th.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for January, 1892, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars.

The normal distribution of pressure for January shows values above 30.20 in two areas, one of which occupies the middle plateau region and the middle-eastern slope of the Rocky Mountains, and the other the interior of the south Atlantic states and eastern Tennessee. From these high areas the barometric gradient is marked northeastward to the Iceland low area and northwestward to the area of low pressure of Bering Sea, and the normal pressure is below 30.00 over the Gulf of Saint Lawrence and on the extreme north Pacific coast. In this month there is a general increase of pressure over the United States, and the highest pressure of the year usually obtains over parts of the middle-eastern and southeastern districts.

In January, 1891, the mean pressure was highest over the middle plateau region, where it was above 30.30, whence it decreased to about 30.05 on the south Pacific and extreme north Pacific coasts. The lowest mean pressure of the month was noted over eastern Canada and eastern New England, where it was below 30.00, from which region there was an increase of pressure to the south Atlantic and east Gulf states, where the mean values were above 30.15.

Chart IV shows that high pressure was persistent over the middle plateau, and Chart I shows that no low pressure areas traversed that region during the month.

A comparison of the pressure chart for January, 1892, with that of the preceding month shows an increase of pressure, except in districts east of the lower Mississippi River and south of the Lake region, and in California and southern Arizona. The greatest increase of mean pressure occurred from northern Missouri over Minnesota, the Dakotas, eastern Montana, and the British Possessions to the northward, where it exceeded .25, and the most marked decrease was noted along the Atlantic coast between the 33d and 39th parallels, where it was more than .15. Along the California coast south of the 38th parallel the decrease was .10.

The mean pressure was above the normal from the west Gulf states and the Mississippi Valley over the middle and northern plateau regions to the Oregon and Washington coasts, the most marked departure above the normal being shown in an area extending from the middle plateau to west Washington, where it was more than .10. Over the eastern and extreme southwestern parts of the country and in the British Possessions the mean pressure was deficient, and at stations in those districts the mean values were .05, or more, below the normal pressure for the month.

HIGH AND LOW AREAS.

The paths of well-defined areas of high and low pressure for January, 1892, are shown on Charts IV and I, respectively, and some of the more prominent characteristics of the high and low areas are noted in the table at the end of this chapter.

HIGH AREAS.

Ten high areas appeared, the average number traced for January during the last 17 years being 9. Two of the high areas advanced from the Pacific coast north of the 45th parallel; 4 first appeared over the British Northwest Territory; 3 apparently developed over the middle plateau region; and one passed northeastward from the lower Rio Grande valley.

One of the Pacific coast high areas, number V, traversed the continent, the average rate of advance being 26 miles per hour, and one of the high areas which appeared over the middle plateau region moved thence northwestward to western Washington and Oregon, thence to Alberta, thence along the eastern slope of the Rocky Mountains to southeastern Texas, and thence eastward over the north part of the Gulf of Mexico and Florida. High pressure prevailed during a great part of the month over the middle plateau region. Three of the high areas traced were offshoots from, and one of the Pacific coast high areas merged into, the permanent high area of the middle plateau. The high areas that appeared north of the 50th parallel generally moved southeastward after crossing the Rocky Mountains, and one high area moved eastward from the middle plateau region to the middle Atlantic states. The following is a description of the high areas referred to:

I.—The month opened with a ridge of high pressure extending from Manitoba to the south Pacific coast, which separated two low areas, one, number I, occupying the middle Mississippi valley, and the other, number II, the north Pacific coast. The pressure was also high off the middle Atlantic coast, high areas XI and XII for December, 1891, having moved to that region during the night of December 31–January 1st. High area I was central over Utah, with pressure above 30.50, and temperature below freezing was noted over the plateau region to the Mexican border, the lowest temperature of the month being recorded at Red Bluff, Keeler, and San Diego, Cal., and Yuma, Ariz., where it was 32°, 23°, 38°, and 32°, respectively. The high area remained nearly stationary over the middle plateau during the 2d and 3d, with pressure rising above 30.70 at Montrose, Colo., the evening of the 1st and the morning of the 2d. By the 4th it had shifted position to western Oregon, and passed thence north of Montana during the 5th. Moving rapidly southeastward along the eastern slope of the Rocky Mountains the center reached southeast Texas the night of the 6th, carrying the line of freezing weather to central Texas and the north part of the Gulf States. Passing eastward over the north Gulf the center passed over the north part of the Florida Peninsula the night of the 7th, with freezing weather along the immediate east Gulf coast and over northern Florida. The temperature continued low over the southeastern part of the country until the 9th. At Jacksonville, Fla., the temperature fell to 31°.7 the morning of the 8th, the lowest temperature of the season at that place, and vegetation was injured by cold as far south as Jupiter, Fla.

II.—Was central over Assiniboia the morning of the 1st, with pressure above 30.40, and temperature below zero over the Dakotas and eastern Montana, and an increase of pressure of .60 in 12 hours at Fort Smith, Ark. During the 2d the high area moved eastward over Manitoba, with freezing weather to central Texas and the interior of the Gulf States, and a temperature fall of more than 40° in 24 hours in western Ontario. The morning of the 3d the area was central north of Lake Superior, the line of freezing weather extended to the north part of the Florida Peninsula, and frost occurred as far south as Jupiter and Tampa, Fla. During the 4th this high area disappeared by a decrease of pressure north of the eastern Lake region. On this date the pressure was high, above 30.20, over the Florida Peninsula, and heavy frost caused great damage to vegetation as far south as Jupiter, Fla.

III.—The approach of this high area from the British Northwest Territory was shown by reports of the 7th, an increase of

pressure of .38 in 12 hours occurring at Qu'Appelle, N. W. T. The evening of the 8th the area was central north of Montana, with pressure above 30.50. The morning of that date the line of freezing weather extended from central New Mexico south of east to northern Florida. Moving rapidly southeastward the high area reached the middle Mississippi valley the evening of the 9th, whence it advanced eastward to Pennsylvania by the morning of the 10th, and thence northeastward to the Gulf of Saint Lawrence by the 11th, with a gradual increase of pressure, readings above 30.80 being noted over the north part of the Gulf of Saint Lawrence on the 11th.

IV.—On the 10th a ridge of high pressure extended over the northern part of the country from the Canadian Maritime Provinces to the Pacific coast, with two areas of higher pressure, one, number III, in the Northeast, and the other, number IV, on the northeast slope of the Rocky Mountains. By the evening of the 11th the high pressure over the western part of the country showed two centers, one over the northern plateau, and the other, number IV, on the middle-eastern slope of the Rocky Mountains. The morning of the 12th the separate high areas had merged into one and occupied the middle-eastern slope, with pressure above 30.60. It remained nearly stationary in that region during the 12th, and by the morning of the 13th shifted position westward to the middle plateau region, where the pressure continued high until after the 15th. On the 10th the temperature fell below zero in the Dakotas, Wyoming, Minnesota, Wisconsin, and Upper Michigan. On the 11th the line of zero temperature extended over Colorado, and the 24-hour temperature fall was 24° at Cheyenne, Wyo. On the 12th zero temperature occurred over Kansas, northern Missouri, and central and northern Illinois, and the temperature was below freezing in Texas, except along the coast line. On the 13th the temperature fell below freezing along the Gulf coast of Texas, and the 24-hour temperature fall was more than 20° on the middle Gulf coast. The morning of the 14th the pressure was high, 30.60, at San Antonio, Tex., clear weather had followed the cloudy and rainy condition attending low area VI, the first heavy frost of the season occurred at Galveston, Tex., and the line of freezing weather extended from the east Gulf coast along the line of the Alleghany Mountain range to the lower Saint Lawrence valley. On this date the 24-hour temperature fall was more than 20° over the interior of the south Atlantic states. The cold wave which originated with this high area caused loss of stock on the ranges of Texas.

V.—Apparently advanced from the Pacific Ocean, and the evening of the 12th was central north of Washington, with pressure above 30.60, and freezing weather southward over the Sacramento and San Joaquin valleys, Cal. During the 13th the center moved eastward north of Montana, with slight pressure changes, and passed thence slowly eastward north of the Dakotas during the 14th, with pressure above 30.80, zero temperature to northern Kansas, and a temperature fall of 38° in 24 hours at White River, Ont. During the 15th the high area moved north of Lake Superior, with a slight decrease of pressure. The line of zero temperature extended to northern Missouri and central Illinois, the temperature was below freezing to the Gulf coast, and the 24-hour temperature fall was more than 30° in western Ontario and in areas in the middle Atlantic and New England states. During the 16th the center advanced from north of the Lake region to eastern New York, where it was joined by high area Va, which had moved from the upper Ohio valley; freezing weather occurred along the Atlantic coast north of the 33d parallel, and the 24-hour temperature fall was more than 20° over a great part of New England and the Canadian Maritime Provinces. On the 17th the high area disappeared off the New England coast, and the lowest temperature of the month occurred in an area extending from Harrisburg, Pa., to Lynchburg, Va., a reading of 4° being noted at Washington, D. C.

VI.—This high area was attended by the principal cold wave of the month in the central valleys and along the eastern slope

of the Rocky Mountains. Its approach from the British Northwest Territory was shown by the evening report of the 15th, and by the evening of the 16th it was central north of Montana, with pressure above 30.80 at Swift Current, N. W. T. On this date the line of zero temperature extended to northeastern Kansas and southern Iowa and thence to the Lake region, the temperature was 4° to 6° below freezing on the middle Gulf coast, the 24-hour temperature fall was 20° to 30° in areas in western Montana and in the region north of eastern Montana, and the pressure decreased .54 in 12 hours at Swift Current. During the 17th the center remained nearly stationary north of eastern Montana, with pressure rising above 31.00, the highest reading, 31.06, being noted at Swift Current, and the 24-hour temperature fall was more than 30° in an area extending over the middle-eastern slope of the Rocky Mountains and thence to southern Iowa.

During the 18th the center moved to the upper valley of the Red River of the North, with a decrease of pressure of .20 to .30, the lowest temperature of the month occurred at stations in the Dakotas and eastern Montana, where it was -24° to -45°, the line of zero temperature extended to northern Oklahoma and northern Indian territories, and the temperature fell generally in the central valleys and the Lake region, the 24-hour decrease being more than 30° in areas on the middle and southeast slopes of the Rocky Mountains and over the northern part of the Lake region. The night of the 18th the area appeared to divide, one part moving to the Lake Superior region, and the other passing southward to Kansas where it was joined by a high area which occupied the middle plateau the evening of the 18th. On the 19th the lowest temperature of the month was noted from the Lake Superior and Lake Michigan regions over Texas, the line of zero temperature reached northern Texas, the temperature fell eastward to the Atlantic coast, the 24-hour decrease exceeding 20° in the middle Gulf states and from eastern New York and northeast Pennsylvania over a large part of New England, and at points in Kansas the temperature was the lowest on record for the month.

VII.—During the 18th a short-lived low area moved northeastward along the west Gulf coast and its passage was followed by a rapid increase of pressure over the west Gulf states, the increase at Abilene, Tex., being .34 in 12 hours. The morning of the 19th high area VI was central over Kansas and a ridge of high pressure extended from the Rio Grande Valley to Lake Superior. The evening of the 19th the highest pressure was noted over southeast Texas. Although high areas VI and VII were parts of the same system of high pressure and there was doubtless a transference of high pressure from Kansas to Texas during the 19th, the marked and independent increase of pressure over Texas during the 18th seems to justify the belief that this high area was to a large extent a new development. By the 20th the center had moved to northeast Arkansas, with pressure above 30.40. On this date the line of zero temperature extended over the Ohio Valley, central New York, and central New England, the lowest temperature of the month occurred from the lower lake region over the Ohio Valley and Mississippi, the minimum being 16° at Vicksburg and Meridian, Miss.; a minimum reading of -21° was reported at Forest Park, Saint Louis, Mo., and the 24-hour temperature fall was 20° to 40° in the Atlantic coast states. Moving eastward the center passed off the Virginia coast during the 22d. The cold wave disappeared off the Atlantic coast during the 21st.

VIII.—Appeared off the north Pacific coast on the 19th, and by the morning of the 20th had advanced to east Oregon, with pressure above 30.40. By the evening report the center had moved to northeast Nevada, with pressure above 30.50. On this date freezing weather occurred over the plateau region to the Mexican border, and the temperature fell 10° to 20° over the east part of the middle plateau. From the 21st to 25th, inclusive, the pressure continued high over the middle plateau region, the values rising to 30.80 at Salt Lake City, Utah, the evening of the 22d and the morning of the 23d.

IX.—On the 25th the pressure was high from the middle plateau region to Manitoba, and the evening report showed this high area central over Manitoba, with pressure above 30.40, and a 24-hour temperature fall of more than 30° from the Lake Superior region to Manitoba. During the 26th the center advanced to northern Illinois, with pressure above 30.50, freezing weather to central Kentucky and central Virginia, and a temperature fall of 20° to 40° from the Lake region to the Atlantic coast between the 35th and 43d parallels. Moving southeastward the center reached extreme western Virginia the evening of the 27th, without marked changes in pressure; the line of freezing weather reached the interior of the east Gulf states, and the 24-hour temperature fall was more than 20° over the south Atlantic states. By the evening of the 28th the high area had reached the east part of the Gulf of Mexico, with a decrease of .10 to .20 in central pressure, and a general rise in temperature in the Atlantic coast states.

X.—During the 28th and 29th the pressure was high over the middle plateau region, the readings ranging from 30.40 to 30.50. Number X was apparently an offshoot from this area of high pressure, and the morning of the 30th an area of high pressure extended along and west of the Mississippi River from Wisconsin to the Gulf, with highest pressure in adjoining parts of southwest Missouri and northern Arkansas. On this date the temperature fell generally over the Lake region and the Ohio Valley and Tennessee, the 24-hour fall ranging from 10° in parts of the Ohio Valley and Tennessee to 32° at White River, Ont. During the 31st the center moved to West Virginia; the cooler condition passed off the Atlantic coast, and a marked rise in temperature occurred west of the Alleghany Mountains.

LOW AREAS.

The low areas of January advance eastward at an average rate of about 37 statute miles per hour, the velocity for January and February being the highest noted for the year. The principal track of low areas in January west of the 100th meridian is traced from Vancouver Island south of east over Montana, North Dakota, and the upper lake region. Passing from the upper lakes almost due eastward over Ontario, the middle Saint Lawrence valley, and southern Newfoundland, the principal track bends northward over the Atlantic Ocean towards the Iceland area of low pressure. Less frequented storm tracks are traced from the east part of the middle plateau region, and from the middle and west Gulf states, and join the principal track in the Saint Lawrence Valley, which is the region of greatest storm frequency in North America, with an average of 4 to 5 low areas for the month of January. A secondary track is also traced northeastward along the Atlantic coast. An average of about two low areas per month traverse the North American continent from the Pacific to the Atlantic coasts in January.

The tracks of 13 low areas are plotted on Chart I for January, 1892, this being the average number traced for January during the last 19 years. Four of the low areas advanced from the Pacific coast north of the 45th parallel; 4 appeared over the British Northwest Territory; one apparently developed east of the Sierra Nevada Mountains in southern Nevada; one, a continuation of low area XIVa for December, 1891, occupied the middle Mississippi valley at the opening of the month; one originated in western Texas, and 2 are traced from the middle Gulf coast region. Of the Pacific coast low areas, 2, numbers VII and XI, traversed the continent, their rate of advance being 46 and 28 miles per hour, respectively. The Pacific coast and British America low areas generally pursued a course eastward over the Saskatchewan Valley to the 100th meridian, whence they moved east-southeast to the Saint Lawrence Valley, and passed thence north of east over the Gulf of Saint Lawrence. The low areas from the middle Gulf region advanced northeastward to the Gulf of Saint Lawrence. The average velocity of low areas of the current month, 32 miles per hour, was about 5 miles per hour less than the average velocity noted for January of preceding years. On the 16th

and 17th and 27th and 28th cyclonic disturbances were indicated in the south Pacific coast region. The following is a description of the low areas traced over the United States and Canada:

I.—Was a continuation of low area XIVa for December, 1891, and the morning of the 1st was central over Illinois, with pressure 29.50, and generally stormy weather from the Lake region to Texas. Over Lake Michigan northwest gales of 50 to 60 miles per hour prevailed. High wind, with rain changing to snow, and a marked fall in temperature, occurred in the Lake region, snow fell thence to eastern Kansas, and severe local storms were reported in the Southwest. On this date there was a decrease of pressure of .52 in 12 hours at Knoxville, Tenn. Moving northeastward the center reached Georgian Bay the morning of the 2d, with a decrease of .15 to .20 in central pressure, severe storms from the Lake region to the New England coast, and a marked increase in temperature in the Atlantic coast states, the 24-hour rise being 26° at Lynchburg, Va. On this date the pressure was relatively high over the Canadian Maritime Provinces, and the center of disturbance passed southeastward and at the evening report occupied an elongated area extending along the boundary line between New York and New England. During the 3d the center occupied eastern New England, where a marked decrease of energy was apparent. On the 4th a decided increase of strength was shown and the center advanced to the west part of the Gulf of Saint Lawrence, and passed thence eastward south of Newfoundland by the morning of the 5th.

II.—Appeared on the north Pacific coast on the 1st, with pressure 29.70, and rain southward over the central valleys of California. During the 2d the center advanced north of Montana, with pressure below 29.60, rain along the Pacific coast north of the 40th parallel and over the northern plateau region, and a marked increase in temperature over Montana. On the 3d the center of disturbance reached Manitoba, with an appreciable loss of energy, a decrease of pressure of .56 in 12 hours at Saint Vincent, Minn., and an increase in temperature of 30° to 40° in 24 hours in North Dakota. Moving southeastward this low area disappeared by an increase of pressure over the Lake region during the 4th.

III.—Apparently developed on the southeast slope of the Rocky Mountains during the 4th, and the morning of the 5th was central near the boundary line of Louisiana and Arkansas, with pressure below 29.60, whence it advanced to the upper valley of the Tennessee River by the evening report, with pressure below 29.50, and rain generally from the Rocky Mountains to New England, the precipitation being in the form of snow north of Tennessee and Virginia. The temperature rose decidedly in the middle and south Atlantic and east Gulf states, and violent storms, assuming the form of tornadoes in northern Georgia and northern South Carolina, occurred in the south Atlantic states. A description of these storms will be found under "Local storms." During the 6th the center advanced to south New England, with pressure below 29.30, a decrease of .50 in 12 hours on the northeastern coast, east gales of 40 to 60 miles per hour on the southeast New England coast, hard gales thence to the Carolinas, a violent thunder and hail storm at Augusta, Ga., in the early morning, and snow, with lower temperature, from the Lake region to the middle Atlantic and New England coasts. During the 7th the center disappeared over the north part of the Gulf of Saint Lawrence without an apparent loss of energy.

IV.—Appeared in the Saskatchewan Valley on the 6th, with pressure below 29.80, whence it moved to Lake Superior by the evening of the 7th, with pressure below 29.60, and snow in the Lake region and extreme northwest. During the 8th this low area apparently disappeared by an increase of pressure north of the Lake region. On this date snow fell in the Ohio Valley and Lake region, and high west to south winds prevailed over the lower lakes.

V.—The evening of the 7th a cyclonic disturbance appeared central over western Texas, with pressure below 29.90, whence

it passed east-southeast and disappeared over the Gulf of Mexico during the 9th, without evidence of marked energy. On the 7th the wind reached a velocity of 42 miles per hour from the south at Abilene, Tex.; on the 8th rain fell on the west Gulf coast; and on the 9th a decided rise in temperature occurred on the middle and east Gulf coasts, and rain fell from Florida to southeast Texas.

VI.—The presence of this low area over the north-central part of the Gulf of Mexico was shown by reports of the 11th, and during the 12th the center advanced across the middle Gulf coast line, with pressure below 29.90, whence it moved northeastward and reached the Gulf of Saint Lawrence the night of the 14th, with central pressure 29.80 to 29.90 throughout its course. This low area was attended by severe rain and sleet storms from the Gulf of Mexico to the Lake region and the New England and middle Atlantic coasts. On the 12th the temperature rose 10° to 20° in the Atlantic coast states, there was a fall in temperature of over 10° from the upper lake region to the west Gulf states, severe rain and sleet storms occurred from Kentucky and West Virginia to the east Gulf states, and snow from eastern Texas to the Ohio Valley. On the 13th very heavy rain fell in the interior of the east Gulf and south Atlantic states, and parts of Tennessee, Maryland, and Virginia, the rain and sleet storm extended to the lower lake region, the temperature rose more than 10° on the immediate Atlantic coast north of Florida, and fell 20° to 30° on the middle Gulf coast, and snow fell generally from the middle Mississippi valley over the Ohio Valley and the eastern Lake region. The morning of the 14th the temperature was high from the Carolinas to south New England, the 24-hour rise exceeding 20° in Virginia and the District of Columbia. In the south Atlantic states the temperature fell rapidly during the day. Snow and sleet fell at New Orleans, La., snow was reported generally in the sugar belt, and very heavy rain fell in Florida.

On the 15th the temperature fell 20° to 30° in the Atlantic coast states, heavy snow fell in the middle Atlantic states, and high north winds prevailed along the Atlantic coast north of the Carolinas.

VII.—Advanced from Vancouver Island to Montana on the 15th, with pressure below 29.90, rain from the north Pacific coast over the northern plateau region, and an increase in temperature of 10° to 20° on the northeast and middle-eastern slopes of the Rocky Mountains. On the 16th the center passed to South Dakota and thence to the Lake Superior region, without evidence of marked strength, whence it moved rapidly to the region north of the Gulf of Saint Lawrence by the evening of the 17th. On the 16th the warmer condition extended to the Alleghany Mountains and Florida, with a 24-hour increase in temperature of 10° to 30° in the central valleys and the Lake region, and snow fell from the middle-eastern slope of the Rocky Mountains over the Lake region. On the 17th the temperature along the immediate Atlantic coast and in the Saint Lawrence Valley fell decidedly, with heavy snow from the western Lake region to the southeast slope of the Rocky Mountains. During the 18th a cyclonic disturbance passed northeast along the west Gulf coast, heavy rain or snow continued from the southeast slope of the Rocky Mountains to New England, and the temperature rose 10° to 20° in the Atlantic coast states. The temperature fell rapidly east of the Mississippi River on the 19th, and the clearing condition reached the Atlantic coast by the 20th.

VIII.—The advance of this low area over the Saskatchewan Valley was attended by an unusually well-defined warm wave or Chinook wind on the eastern slope of the Rocky Mountains from the British Northwest Territory to Colorado. During the 18th the temperature rose 20° to 30° in Alberta. At the evening report this low area appeared over northern Alberta as a disturbance of marked strength, with pressure 29.52 at Edmonton. An area of high pressure occupied the middle plateau region, and a second high area was central over the Red River of the North Valley. Over a great part of the

eastern slope of the Rocky Mountains north of Texas the temperature was below zero; over the Dakotas and east and north Montana the minimum temperature was -25° to -45°; over the middle plateau region the temperature was 10° to 30° above zero; over Oregon and Washington it was 35° to 40° above zero; and rain, with south to west winds, set in during the day on the north Pacific coast.

The morning of the 19th the storm-center had moved eastward over the Saskatchewan Valley to the 105th meridian, with pressure 29.50 at Prince Albert, a decrease of pressure of more than .90 in 12 hours being noted in Assiniboia; the pressure had decreased .10 to .20 over the middle plateau; the high area which occupied the Red River of the North Valley at 8 p. m. of the 18th had divided, one part appearing over the north Lake Superior region and the other over Kansas; the 24-hour temperature rise exceeded 50° over the eastern half of Montana; the increase in temperature was more than 30° along the eastern slope of the Rocky Mountains to the 40th parallel; the warmer condition extended over the western part of the central valleys; and a cold wave of marked severity overspread the country from the Gulf of Mexico to the eastern Lake region. Rain was followed by clearing weather on the north Pacific coast; rain or snow fell in the middle and northern plateau regions; and snow in the middle Missouri and Red River of the North valleys. No precipitation was reported on the northeast and middle-eastern slopes of the Rocky Mountains; and south to west winds, reaching a velocity of 30 to 40 miles per hour on the middle and northeast slopes of the Rocky Mountains, prevailed from the north Pacific coast to the 100th meridian.

At 8 p. m. of the 19th the center of disturbance was located over or north of Manitoba, with pressure below 29.60, and a ridge of high pressure extended from Ontario to Texas; a 24-hour temperature rise of more than 40° was noted from Assiniboia and western Manitoba to central Nebraska; the warmer condition had extended to a line traced from Upper Michigan to Louisiana; and the 24-hour temperature fall was 10° to 20° from New England to the east Gulf states. The morning of the 20th the low area was central north of Lake Superior, with pressure below 29.80, and the ridge of high pressure extended from the Saint Lawrence Valley to the lower Mississippi valley; the 24-hour temperature rise was 62° at White River, Ontario, and was 20° to 40° from Manitoba to Texas; the warmer condition extended eastward to a line traced from Lake Huron to the lower Mississippi valley; the fall in temperature was 10° to 30° in the middle and south Atlantic states, and 30° to 40° in New England; and a temperature fall of 10° to 15° was noted on the northeast slope of the Rocky Mountains.

The evening of the 20th the center was north of eastern Lake Superior, with pressure below 29.80, and the pressure was high in the Atlantic coast states and over the middle and southern districts; the 24-hour temperature rise was 20° to 30° in the central valleys and the Lake region; the warmer condition had extended to the Alleghany Mountains; the temperature fall was 10° to 30° in the Atlantic coast states, and 10° to 20° over the east part of the middle plateau region and on the middle and northeast slopes of the Rocky Mountains. Advancing rapidly eastward north of the lower lake region the center reached the Gulf of Saint Lawrence by the evening of the 21st, without an apparent increase of energy; the pressure continued high over the middle and southern districts; the cold wave passed off the Atlantic coast; and a general rise in temperature was noted east of the Rocky Mountains. The precipitation attending this low area was general east of the plateau region, except on the northeast slope of the Rocky Mountains; it was generally light, and was recorded as snow as far south as the Southern and Southwestern States. The wind velocity was greatest, 56 miles per hour from the south at Huron, S. Dak., on the 19th, and a velocity of 55 miles per hour from the southwest was noted at Buffalo, N. Y., on the 21st.

The following copy of a section of the thermograph record sheet at Fort Assinaboine, Mont., covering the period from noon

January 18th to noon January 19th, shows the remarkable temperature change caused by the Chinook wind which commenced at that station the early morning of the 19th, a rise of about 43° being registered in 15 minutes.

Record of thermograph, Fort Assinaboine, Mont., noon January 18 to noon January 19, 1892 (in degrees Fahrenheit).

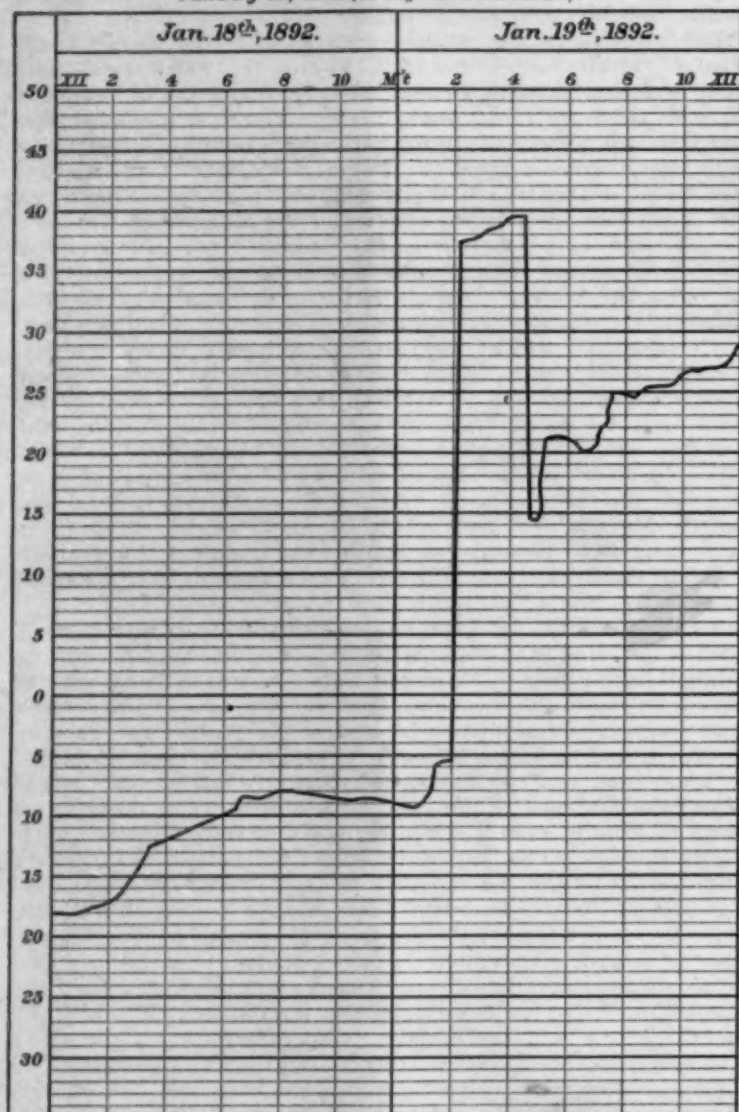


Chart VII, with this number of the REVIEW, shows the general meteorological conditions west of the 90th meridian at the 8 p. m. report of January 18th, which preceded, and at the 8 a. m. report of the 19th, which followed, the temperature change on the eastern slope of the Rocky Mountains above referred to.

A discussion of the warm winter winds of that region will be found under the heading "Chinook winds," in this issue of the REVIEW.

IX.—This low area followed closely number VIII. It appeared over Alberta during the 20th, and the evening of that date the pressure was lowest, 29.54, at Calgary. Unlike the conditions which existed with the appearance of low area VIII the temperature was high, above the freezing point, over the northeastern slope of the Rocky Mountains at this observation; otherwise they were somewhat similar, the pressure being high over the middle plateau region and thence over the middle Mississippi valley, and rain, with south to west winds and temperature 40° to 45° , was noted on the north Pacific coast. The temperature rose 8° to 14° over northern Montana and in Alberta, and fell 10° to 20° over the eastern part of the middle plateau region, with snow in eastern Colorado and Kan-

sas. By the morning of the 21st the center had moved to eastern Assiniboia, with pressure below 29.40. The pressure continued high over the southern and west-central districts; the temperature rise was 20° to 30° in 24 hours in eastern Montana and the British Northwest Territory, and snow fell in Assiniboia.

At the evening report the center was north of Minnesota, with pressure below 29.60; the pressure was high from the middle plateau region to the middle Atlantic coast; the temperature rose generally east of the Rocky Mountains, except on the northeast slope; and snow fell in Assiniboia, Manitoba, and North Dakota. During the 22d the center of disturbance moved eastward north of the Lake region, with pressure below 29.60; the temperature rose east of the Rocky Mountains, except from the extreme upper Mississippi valley over North Dakota and Manitoba, where it fell 10° to 20° ; snow fell in the Lake region, and rain in the lower Mississippi valley and the west Gulf states. During the 23d the center passed over the Gulf of Saint Lawrence, with an apparent increase of energy; the warmer condition passed off the Atlantic coast; a decided fall in temperature occurred over the north part of the Lake region; and rain or snow, followed by clearing weather, prevailed east of the Mississippi River.

X.—Followed closely number IX. It appeared over Alberta the morning of the 22d, with pressure below 29.90, and passed thence eastward to the 105th meridian by the evening report, with pressure falling below 29.70. No rain or snow fell in the Northwest; the temperature rose 5° to 16° on the northeast slope of the Rocky Mountains; and wind velocity of 30 to 40 miles per hour from southwest to northwest was noted over Montana and North Dakota. During the 23d the center moved north of Lake Superior, with pressure below 29.70; light snow fell over the east Lake region, and the temperature rose 30° to 40° in the Red River of the North Valley. Moving slowly eastward, with a marked decrease of pressure, the center reached the region north of the lower lakes during the 24th. The temperature rose 10° to 40° over the Lake region, the increase being greatest at White River, Ont.; snow fell in the eastern Lake region and along the Atlantic coast north of the 40th parallel; and brisk to high westerly winds prevailed over the Great Lakes.

By the evening of the 25th the center reached the Maine coast, with pressure below 29.40. The temperature rose 10° to 20° in the middle Atlantic and New England states; light rain or snow fell from the eastern Lake region over New England; and high westerly winds prevailed along the Atlantic coast to the Carolinas. On the 26th the center remained nearly stationary near the east New England coast, with pressure falling to 29.20. The temperature rose 10° to 20° over the Canadian Maritime Provinces, elsewhere east of the Rocky Mountains there was a decided fall in temperature; northwest gales of 50 to 60 miles per hour prevailed along the coast from south New England to Virginia; and snow fell from the lower lakes over New England. By the morning of the 27th the center had passed east of Nova Scotia; high winds, reaching a velocity of 56 miles per hour from the northwest at Woods Holl, Mass., continued along the middle Atlantic and New England coasts during the 27th; and the clearing condition attending high area IX extended to the Atlantic coast.

XI.—Appeared off the north Pacific coast on the 25th, with pressure below 29.50; east to southeast winds of 60 to 70 miles per hour occurred along the Washington coast; and rain fell in Oregon and north California. During the 26th the low area advanced to Alberta, with pressure below 29.60; rain fell over the west part of the plateau region and along the Pacific coast to San Diego, Cal.; and a 24-hour temperature rise of 10° to 20° was noted over Utah and western Colorado. On the 27th the center reached Manitoba, with slight changes in central pressure; scattered rains fell in the Northwest and along the Pacific coast; the temperature rose 10° to 30° from the Rocky Mountains over the Lake region, a 24-hour rise of 38° being noted at White River, Ont.; and high south to west

winds prevailed in the Missouri Valley. Moving slowly eastward during the 28th the center reached the region north of Lake Superior, and passed thence southeast to the lower lake region by the evening of the 29th.

On the 28th the 24-hour temperature rise was 10° to 20° in the Atlantic coast states; rain or snow fell from the lower lake region over New England; and high south to west winds prevailed over the Great Lakes. On the 29th the temperature rose 10° to 20° along the Atlantic coast and in the east Gulf states; rain or snow fell from the Lake region and Ohio Valley over the middle Atlantic and New England states; and brisk to high winds shifting to north and west prevailed over the Lakes. Moving southeast, the low area was central off the middle Atlantic coast the morning of the 30th, whence it moved slowly northeastward, and at the close of the month was central south of Newfoundland, with pressure below 29.50. During the last two days of the month destructive north to northeast gales prevailed along the New England coast; the winds were heavy along the coast to the Carolinas; and cooler, clearing weather extended over the coast line.

XII.—Appeared off the north Pacific coast and passed thence to Alberta during the 29th, with pressure below 29.40 at the evening report. The temperature rose 10° to 20° on the northeast slope of the Rocky Mountains, and rain fell on the north Pacific coast. The center moved to Manitoba during

the 30th, with an increase of about .30 in pressure. The warmer condition extended to the Lake region, and the temperature fell 10° to 20° on the northeastern slope of the Rocky Mountains. No precipitation attended this low area east of the Rocky Mountains.

XIII.—During the 29th the weather was unsettled on the south Pacific coast and over the south part of the plateau region, and rain fell from southern California to western Texas. During the 30th the 12-hour decrease of pressure was .10 to .20 in that region, a decrease of .20 being noted at Keeler, Cal. At the evening report of the 30th a low pressure area was apparently central on the eastern slope of the Sierra Nevada Mountains south of the 40th parallel; rain fell from California over the middle and southern plateau regions, the rainfall being very heavy over parts of the southern plateau; and a wind velocity of 40 miles per hour from the west was noted at Tucson, Ariz. Advancing rapidly eastward the center reached northern Kansas the evening of the 31st, with pressure below 29.80. The 24-hour temperature fall at the morning report was more than 30° in southern Assiniboia, and this condition advanced to the middle-eastern slope of the Rocky Mountains by the evening report; rain or snow fell from the middle and southern plateau regions to the Lake region; and the wind reached a velocity of 40 miles per hour from the south at Amarillo, Tex.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum pressure change in 12 hours, maximum temperature change in 24 hours, and maximum wind velocity.											
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.				Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.		
High areas.						Days.	Miles.			Inch.										
I	1	39	110	29	34	6.5	29		Swift Current, N. W. T.	.50	5	Omaha, Nebr.	.30	6	Fort McKinney, Wyo.	n.	42	5		
II	1	52	104	49	87	2.0	17		Fort Smith, Ark.	.60	1	White River, Ont.	.45	2	Chicago, Ill.	nw.	52	3		
III	8	51	110	49	66	2.5	44		Qu'Appelle, N. W. T.	.35	7	White River, Ont.	.25	9	Kitty Hawk, N. C.	ne.	42	10		
IV	11	40	100	40	110	2.0	21		Salt Lake City, Utah.	.35	11	Cheyenne, Wyo.	.24	11	Montrose, Colo.	e.	26	11		
V	12	51	122	43	68	4.5	26		Sydney, C. B. I.	.40	17	White River, Ont.	.38	14	Block Island, R. I.	n.	36	17		
VI	16	52	110	38	97	2.5	21		Swift Current, N. W. T.	.54	16	Wichita, Kans.	.34	17	Bismarck, N. Dak.	nw.	30	17		
VII	19	29	98	36	79	2.0	29		Abilene, Tex.	.34	18	Wilmington, N. C.	.32	20	Narragansett Pier, R. I.	nw.	30	22		
VIII	19	47	125	41	116	1.0	25		Qu'Appelle, N. W. T.	.50	20	Cheyenne, Wyo.	.20	20	Helena, Mont.	sw.	36	22		
IX	25	52	97	39	87	3.0	28		White River, Ont.	.64	25	White River, Ont.	.46	26	Kitty Hawk, N. C.	n.	36	27		
X	30	38	95	39	80	1.5	22		Port Huron, Mich.	.30	30	Pueblo, Colo.	.24	28	Hatteras, N. C.	n.	38	31		
Mean							2.8	26		.46			.32				36			
Low areas.										Fall.			Rise.							
I	1	40	90	45	65	3.5	20		Knoxville, Tenn.	.52	1	Lynchburgh, Va.	.26	2	Chicago, Ill.	nw.	60	1		
II	2	48	125	43	87	2.0	45		Saint Vincent, Minn.	.56	3	Fort Buford, N. Dak.	.38	3	Fort Canby, Wash.	s.	48	3		
III	5	33	93	48	68	2.0	39		Boston, Mass.	.50	6	Montgomery, Ala.	.24	5	Block Island, R. I.	e.	60	6		
IV	6	52	103	48	83	2.0	23		Chatham, N. B.	.50	7	White River, Ont.	.28	8	Buffalo, N. Y.	sw.	48	8		
V	6	33	102	38	92	1.5	17		Medicine Hat, N. W. T.	.54	6	Pensacola, Fla.	.27	9	Abilene, Tex.	s.	42	7		
VI	12	29	90	49	67	2.5	32		Galveston, Tex.	.18	8	Wilmington, N. C.	.24	12	Pensacola, Fla.	s.	38	12		
VII	15	49	125	50	68	2.5	46		New York, N. Y.	.32	13	Rapid City, S. Dak.	.34	14	Fort Canby, Wash.	s.	38	15		
VIII	18	53	115	47	77	2.5	29		Prince Arthur, Ont.	.56	16	Sault de Ste. Marie, Mich.	.24	17	Huron, S. Dak.	sw.	55	19		
IX	20	51	113	47	66	2.5	39		Qu'Appelle, N. W. T.	.92	19	White River, Ont.	.62	20	Fort Assinaboine, Mont.	sw.	48	21		
X	22	51	113	45	67	4.5	22		White River, Ont.	.70	21	White River, Ont.	.58	22	Woods Holl, Mass.	nw.	36	27		
XI	26	47	125	42	65	5.0	28		Duluth, Minn.	.48	23	White River, Ont.	.44	24	Fort Canby, Wash.	se.	39	25		
XII	29	49	127	48	88	2.0	37		Calgary, N. W. T.	.68	29	White River, Ont.	.36	31	Tucson, Ariz.	w.	61	29		
XIII	30	37	118	40	98	1.0	42		Pueblo, Colo.	.26	31	Wichita, Kans.	.16	31	Amarillo, Tex.	s.	40	30		
Mean							2.6	32		.51			.35				51			

* Continuation of low area XIV for December, 1891.

NORTH ATLANTIC STORMS FOR JANUARY, 1892 (pressure in inches and millimeters; wind-force by Beaufort scale).

The paths of storms that appeared over the west part of the north Atlantic Ocean during January, 1892, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

In January there is usually an increase of pressure over the southern parts of the north Atlantic Ocean, the increase ex-

ceeding .05 in an area about midway between the Azores and Windward West Indies. Over the northern part of the ocean there is a decrease of pressure. The storms of this month generally advance over the ocean from the Canadian Maritime Provinces, and move thence in an east-northeast to northeast course toward the Iceland low area. The average number of storms that traverse the north Atlantic from coast to coast in January is 2.5, and in a majority of instances these storms skirt the southern quadrants of the Iceland low area and pass

over or north of the North Sea. The average velocity of north Atlantic storms in January is about 22 statute miles per hour.

The month opened with high pressure east of the 45th meridian and low pressure over Newfoundland and the Grand Banks. The pressure continued high over mid-ocean between the 45th and 55th parallels until the 13th, after which the high area settled southward to its usual position south of the 40th parallel. Over the British Isles the pressure continued high until the 4th; from the 4th to 24th the pressure continued low and unsettled weather prevailed over the eastern part of the ocean, which condition was followed by high pressure from the 25th to the close of the month. The pressure continued low between the 50th and 70th meridians until the 7th; from the 8th to 18th high pressure prevailed in that region; and from the 19th until the close of the month low pressure and unsettled weather obtained over and west of Newfoundland and the Grand Banks.

On the 1st a storm, with pressure about 29.70 (754) and east gales of force 10, was central south of Newfoundland, whence it passed southeastward to about the 40th parallel by the 2d, with an apparent increase of energy, and on the 3d and 4th was central west of the Azores. By the 5th this storm had apparently passed northwestward and united with low area I which had advanced south of Newfoundland. The high area over mid-ocean, above referred to, prevented the advance of this storm and finally forced it westward. During the 4th low area I moved from the Bay of Fundy to the west part of the Gulf of Saint Lawrence, and passed thence south of Newfoundland by the morning of the 5th, with pressure falling to about 29.30 (744) and gales of force 7 to 9. The influence of this storm was felt to the Bermudas on the 4th and 5th, where the wind veered from south to west and reached force 3 to 4. On the 6th this storm was central north of the Grand Banks, after which it disappeared north of the region of observation.

On the 5th a storm of considerable energy was central over the North Sea, and it was apparently central in that region on the 6th, with a heavy snowstorm in northern Scotland. On the 7th British pressure was reported lowest over Ireland, and heavy snow fell in parts of England and Ireland. On this date low area III passed north of the Gulf of Saint Lawrence, and a storm appeared central near the Azores. On the 8th a storm was central over the east part of the North Sea, and heavy snow and cold weather were reported over Great Britain. Snow and rain continued in England and Scotland on the 9th. The pressure continued low over the eastern part

of the ocean, and on the 11th a storm was apparently central southwest of the Bay of Biscay, whence it probably moved eastward over the Spanish Peninsula by the 13th. On the 14th the pressure was low east of the 35th meridian, and on the following date the pressure fell to 29.10 (739) in Ireland.

On the 16th the pressure continued low over the eastern part of the ocean, the pressure was 29.20 (742) over Ireland, and a heavy gale was reported at Lisbon, Portugal. On the 17th the pressure was lowest west of the British Isles, in about W. 20°; on the 18th a trough of low pressure extended from the Spanish Peninsula to Iceland, and the pressure continued low in those regions until the 23d. On the morning of the 19th a storm appeared central near western Nova Scotia, whence it advanced north of the Grand Banks by the 20th, with a marked display of energy. The pressure continued low along the trans-Atlantic steamship routes west of the 50th meridian during the balance of the month under the influence of low areas IX, X, and XI. The eastward movement of these storms caused low pressure over mid-ocean until the 30th, while over the eastern part of the ocean high pressure prevailed from the 24th until the close of the month.

OCEAN ICE.

No Arctic ice was reported for January, 1892. In January, 1891, 3 large icebergs were observed in N. 46° 30', W. 52° 46' on the 28th, and on the 31st patches of soft ice were encountered in N. 45° 50', W. 59° 20'. In 1890 vast fields of ice and enormous icebergs were reported over and near the Banks of Newfoundland north of the 43d parallel. In 1889 no ice was reported. In January, 1882 to 1888, inclusive, Arctic ice in small quantities was reported east of Newfoundland, but in no case was it sighted south of the 43d parallel.

OCEAN FOG.

The limits of fog belts west of the 40th meridian, as reported by shipmasters, are shown on Chart I by dotted shading. Near the Banks of Newfoundland fog was reported on 17 dates; between the 55th and 65th meridians on 10 dates; and west of the 65th meridian on 2 dates. Compared with the corresponding month of the last 4 years the dates of occurrence of fog east of the 55th meridian numbered 12 more than the average; between the 55th and 65th meridians 1 more than the average; and west of the 65th meridian 5 less than the average. The dense fog noted by shipmasters and reported at stations of the Weather Bureau along the New England, New York, and New Jersey coasts generally attended the advance or passage of general storms.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for January, 1892, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the average for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest over extreme southern Florida, where it was above 65; it was above 50 over the Florida Peninsula, along parts of the immediate Gulf coast, in the lower Colorado and lower Gila valleys, and on the immediate Pacific coast south of the 38th parallel; and was above 40 over the south parts of the south Atlantic and Gulf states, in extreme southern New Mexico, and west of a line

traced from east-central Arizona over the west side of the Sierra Nevada Mountain range to northwestern California, and thence northward inside the coast line to Vancouver Island. The mean temperature was lowest in Manitoba and eastern Saskatchewan, where it was below -5; it was below zero at points on the north shore of Lake Superior, in northern Minnesota, and northeastern North Dakota; and was below 20 north of a line traced from southern New Brunswick irregularly south of west to the middle-eastern slope of the Rocky Mountains, thence to southeastern Montana, thence to extreme north-central New Mexico, and thence to western Montana. The mean temperature was also below 20 in an area which occupied the central part of the middle plateau region.

DEPARTURES FROM NORMAL TEMPERATURE.

The mean temperature was above the normal along the Pacific coast, thence eastward over the northern part of the country to the Red River of the North and extreme upper Mississippi valleys, and thence southwestward over the southeast slope of the Rocky Mountains and the east part of the

southern plateau region. The mean values were also above the normal over the north part of the Lake region, in the Saint Lawrence Valley, the Canadian Maritime Provinces, New England, and at points along the immediate Atlantic coast north of the 35th parallel. Over a great part of the middle and southern plateau regions, and from the Lake region to the Gulf and south Atlantic coasts the mean temperature was below the normal. The most marked excess in temperature occurred in Alberta and western Assiniboia, where it exceeded 10, and an excess of more than 5 was noted in the Canadian Maritime Provinces. The greatest deficiency in temperature appeared in an area extending from the south part of the upper lake region southward over the middle Ohio valley to the middle and west Gulf coasts, where the mean readings were more than 4 below the normal.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for January for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for January, 1892; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for January during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of Jan.	(2) Length of record.	(3) Mean for Jan., 1892.	(4) Departure from normal.	(5) Extreme monthly mean for January.			
						Highest.	Year.	Lowest.	Year.
Arkansas.		°	Years	°	°	°		°	
Lead Hill.....	Boone.....	33.6	10	.....	.....	45.6	1890	24.2	1886
California.									
Sacramento.....	Sacramento ..	46.3	26	48.8	+ 2.5	52.7	1873	38.4	1890
Connecticut.									
Middletown.....	Middlesex.....	25.1	24	.....	.....	33.7	1890	17.3	1888
Florida.									
Merritts Island....	Brevard.....	62.6	10	60.6	- 2.0	69.8	1882	55.4	1886
Georgia.									
Forayth.....	Monroe.....	48.2	18	44.2	- 4.0	59.4	1880	40.8	1884
Illinois.									
Peoria.....	Peoria.....	24.6	36	21.4	- 3.2	40.9	1880	13.5	1857
Riley.....	McHenry.....	15.0	36	14.6	- 0.4	33.2	1880	5.5	1875
Indiana.									
Vevay.....	Switzerland ..	31.4	26	26.8	- 4.6	47.2	1880	23.0	1884
Iowa.									
Cresco.....	Howard.....	9.8	20	10.7	+ 0.9	26.1	1880	- 1.3	1883
Monticello.....	Jones.....	16.5	23	13.8	- 2.7	32.9	1880	6.0	1883
Logan.....	Harrison.....	18.7	18	18.7	0.0	34.4	1880	7.1	1886
Kansas.									
Lawrence.....	Douglas.....	26.7	29	24.0	- 2.7	41.2	1880	14.3	1886
Wellington.....	Sumner.....	25.9	13	.....	.....	40.4	1880	17.6	1886
Louisiana.									
Grand Coteau.....	Saint Landry ..	52.3	9	47.2	- 5.1	64.0	1890	47.2	1892
Maine.									
Orono.....	Penobscot.....	15.3	18	22.2	+ 6.9	24.7	1889	8.2	1875
Maryland.									
Cumberland.....	Allegany.....	30.0	33	30.0	0.0	40.7	1890	19.6	1865, '67
Massachusetts.									
Amherst.....	Hampshire.....	23.6	56	25.2	+ 1.6	32.3	1889	13.5	1857
Newburyport.....	Essex.....	24.5	15	.....	.....	33.1	1880	13.7	1857
Somerset.....	Bristol.....	27.1	19	30.9	+ 3.8	35.7	1880	19.4	1888
Michigan.									
Kalamazoo.....	Kalamazoo.....	22.1	16	21.8	- 0.3	36.0	1880	14.0	1881
Thornville.....	Lapeer.....	22.6	15	20.0	- 2.6	35.6	1880	15.6	1881
Minnesota.									
Minneapolis.....	Hennepin.....	8.8	27	9.5	+ 0.7	23.2	1880	- 4.4	1875
Montana.									
Fort Custer.....	Custer.....	10.7	12	20.6	+ 9.9	28.6	1891	2.2	1886
New Hampshire.									
Hanover.....	Grafton.....	17.5	54	21.5	+ 4.0	26.5	1838	6.8	1857, '88
New Jersey.									
Moorestown.....	Burlington.....	29.6	28	29.4	- 0.2	40.1	1890	22.2	1867
South Orange.....	Essex.....	28.9	21	27.7	- 1.2	37.6	1880	23.8	1884
New York.									
Cooperstown.....	Otsego.....	20.4	38	20.3	- 0.1	31.6	1880	10.3	1857
Palermo.....	Oswego.....	20.9	38	.....	.....	29.4	*	11.6	1888
North Carolina.									
Lenoir.....	Caldwell.....	36.3	20	35.8	- 0.5	46.5	1890	30.2	1882
Ohio.									
N'th Lewisburgh..	Champaign.....	27.6	60	23.4	- 4.2	41.0	1880	14.0	1856, '57
Wauseon.....	Fulton.....	23.3	28	19.2	- 4.1	37.7	1880	12.2	1875
Oregon.									
Albany.....	Linn.....	37.6	14	38.3	+ 0.7	43.8	1887	22.8	1868
Eola.....	Polk.....	37.2	21	37.6	+ 0.4	42.7	1874	29.7	1875
Pennsylvania.									
Dyberry.....	Wayne.....	21.2	27	21.4	+ 0.2	31.6	1890	13.9	1865
Grampian Hills....	Clearfield.....	23.2	27	21.9	- 1.3	35.0	1880	16.1	1867
Wellsborough.....	Tioga.....	25.7	12	22.0	- 3.7	35.8	1890	19.1	1884
South Carolina.									
Statesburgh.....	Sumter.....	45.6	10	42.2	- 3.4	54.6	1890	39.0	1886
Tennessee.									
Austin.....	Willson.....	37.3	23	32.5	- 4.8	53.1	1880	28.2	1884

Deviations from normal temperature—Continued.

State and station.	County.	(1) Normal for the month of Jan.	(2) Length of record.	(3) Mean for Jan., 1892.	(4) Departure from normal.	(5) Extreme monthly mean for January.			
						Highest.	Year.	Lowest.	Year.
Texas.		°	Years	°	°	°		°	
New Ulm.....	Austin.....	50.7	18	45.4	- 5.3	63.7	1880	34.8	1875
Vermont.									
Strafford.....	Orange.....	16.3	18	19.1	+ 2.8	25.4	1889	6.9	1888
Virginia.									
Birdsnest.....	Northampton	39.9	23	38.9	- 1.0	49.6	1890	33.7	1881
Washington.									
Fort Townsend.....	Jefferson.....	38.0	20	38.5	+ 0.5	55.4	1888	29.6	1869
Wisconsin.									
Madison.....	Dane.....	17.1	29	13.9	- 3.2	33.6	1880	4.1	1875

* 1863, 1880, and 1890.

YEARS OF HIGHEST MEAN TEMPERATURE FOR JANUARY.

At Los Angeles, Cal., 15 years' record, the current month was the warmest January on record. The mean temperature at that station was 3.6 above the normal, and 0.8 above the highest mean previously reported for January, noted in 1891. The highest mean temperature for January occurred from western Minnesota to the north Pacific coast in 1891; along the Atlantic and east Gulf coasts, and on the southeast slope of the Rocky Mountains in 1890; over the middle and northern plateau regions in 1887; and from the Alleghany Mountains over the Lake region, the Ohio and Mississippi valleys, the middle-eastern slope of the Rocky Mountains, and the west Gulf coast in 1880.

YEARS OF LOWEST MEAN TEMPERATURE FOR JANUARY.

The lowest mean temperature for January was noted from the California coast over Nevada and eastern Oregon in 1890; on the New England coast, and in an elongated area extending from the north Pacific coast to Lake Michigan in 1888; from the southeast slope of the Rocky Mountains and east Kansas to the south Atlantic coast in 1886; and on the middle-eastern slope of the Rocky Mountains in 1875. In 1890, when the mean temperature was the highest ever noted for January along the Atlantic and east Gulf coasts and on the southeast slope of the Rocky Mountains, it was the lowest recorded for that month in California, Nevada, and eastern Oregon.

MAXIMUM TEMPERATURE.

At Fort Assinaboine, Mont., Valentine, Nebr., Concordia, Kans., and Escanaba, Mich., the maximum temperature for the current month was the highest ever reported for January during the respective periods of observation by amounts varying from 1 at Concordia, Kans., to 5 at Valentine, Nebr.

The maximum temperature was above 80 over the southern half of the Florida Peninsula, in the lower Rio Grande valley, and at Los Angeles, Cal. Reports of voluntary observers show maximum temperature above 90 in the Colorado Desert, south-eastern California, and a reading of 90 was noted at Fort Ringgold, Tex. The lowest maximum temperature was reported from north New England over the north and west parts of the Lake region, the upper Mississippi valley, Minnesota, and North Dakota, where it was below 50. The maximum temperature was also below 50 over a great part of the middle and northern plateau regions.

MINIMUM TEMPERATURE.

Exceptionally low minimum temperatures for January were not reported. The minimum temperature was below zero north of a line traced from the Maine coast irregularly west-southwest to west-central Texas, thence over northern Arizona and southern Nevada, and thence irregularly northward over Oregon and Washington. The lowest temperature was noted in the valley of the Red River of the North, and in northern North Dakota and eastern Montana, where it was below -40, and a reading of -45 was recorded at Miles City, Mont., on the 18th. The highest minimum temperature, 53,

was noted at Key West, Fla., and the minimum reading was 40 at San Francisco, Cal.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart V by a line traced over the Florida Peninsula west-southwest from Jacksonville. The western limit of freezing weather is shown by a line traced along the immediate Pacific coast north of the 41st parallel, and thence over the central valleys of California to the lower Colorado valley.

RANGES OF TEMPERATURE.

The greatest daily ranges of temperature are shown in the table of miscellaneous meteorological data. The greatest monthly ranges occurred in an area which extended from eastern Montana over eastern Wyoming and northwestern Nebraska, where they exceeded 90. From that region they decreased eastward to less than 50 at points on the middle Atlantic and south New England coasts; southeastward to less than 30 in extreme southern Florida; southward to less than 50 on the immediate Gulf coast; and westward to less than 30 on the middle and north Pacific coasts.

PERIODS OF HIGH TEMPERATURE.

The month opened with high temperature east of the Mississippi River, and at points in the upper Mississippi valley and the Lake region and thence to the east Gulf coast the maximum readings were the highest noted for the month. The warmer condition extended over the northeastern states during the 2d, and a marked fall in temperature occurred in the Atlantic coast states south of the 40th parallel. On the 2d the temperature rise was 10 to 15 in the Northwest, and on the 3d the 24-hour rise was 20 to 30 in the Red River of the North Valley. On the 4th the warm wave reached the south Atlantic states, a temperature rise of more than 20 being noted in that district. On the 3d and 4th the highest temperature of the month was noted over the west part of the middle plateau region. The morning report of the 7th showed a 24-hour temperature rise of 20 to 30 over the Dakotas; the warmer condition reached the middle and south Atlantic states on the 8th; and the temperature rose 10 to 15 on the Gulf coast during that date.

The morning of the 11th a 24-hour temperature rise of 20 to 30 was noted over the Lake region, and this condition extended to the Atlantic coast during the 12th. From the 15th to 17th a warm wave moved from the northeast slope of the Rocky Mountains to the Atlantic coast. A well-defined warm wave advanced from Alberta to the Atlantic coast from the 18th to 21st, with a temperature rise of more than 50 in Montana on the 19th, a rise of 40 to 60 from the middle-eastern slope of the Rocky Mountains over the Lake region on the 20th, and a rise of 10 to 20 in the Atlantic coast states on the 21st. A warm wave advanced from Manitoba to the north-eastern districts from the 21st to 23d. On the 23d a marked temperature rise was noted in the Red River of the North Valley and over the western Lake region, with the highest temperature of the month, 43, at Saint Vincent, Minn., whence the warm wave advanced to the middle Atlantic and New England states by the 25th, where the 24-hour increase in temperature was 10 to 20.

The highest temperature of the month was reported generally along the middle and south Pacific coasts from the 20th to 24th, and over Utah and eastern Arizona on the 25th and 26th. On the 26th the 24-hour temperature rise exceeded 20 in Utah. The warmer condition extended eastward, with an increase in temperature of 10 to 30 over the Lake region during the 27th, and reached the Atlantic coast on the 28th. The morning report of the 29th showed a 24-hour temperature rise of 14 to 16 on the north Pacific coast; the highest temperature of the month was noted at Olympia, Wash., and Portland, Oregon, and an increase in temperature was noted on that date over the Rocky Mountain and plateau regions. During the 30th the warmer condition extended over the upper

Lake region, with a temperature rise of 10 to 20 in the Valley of the Red River of the North, and the highest temperature of the month in the middle and southern Rocky Mountain regions. On the 31st the warm wave reached the Alleghany Mountains; the temperature rise was 10 to 20 in the middle and upper Mississippi valleys and the Lake region, and the highest temperature of the month was reported at points between the middle Mississippi river and the Rocky Mountains.

PERIODS OF LOW TEMPERATURE.

The month opened with temperature below zero over Minnesota, the Dakotas, and the British Northwest Territory. During the 2d the cold wave advanced to the Atlantic coast with a temperature fall of more than 30 in the Atlantic coast states, and freezing weather to northern Florida by the morning of the 3d. The morning of the 6th the temperature was below zero in the Dakotas and the Red River of the North Valley. On the 7th the temperature fell decidedly from the Lake region to the south Atlantic coast, with freezing weather to the east Gulf coast, and the lowest temperature of the month in eastern Tennessee and the east part of the Gulf States. On the 8th a cold wave overspread the Northwest, and reached the central valleys on the 9th, with a temperature fall of more than 20 in Texas and the northern Lake region, and by the evening report the cooler condition had reached the Atlantic coast.

On the 10th and 11th a cold wave overspread the middle and northern plateau regions, eastern Oregon, and Washington, with a 24-hour temperature fall of more than 20 over the middle Rocky Mountain region, and the lowest temperature of the month over the northern plateau and the east part of the middle plateau. During the 12th the cold wave advanced over the Mississippi Valley and the Lake region. The cooler condition did not reach the south Atlantic coast states until the 14th, and extended over the middle Atlantic and New England states the night of the 14-15th. A 24-hour temperature fall of more than 20 was noted in the Northwest the morning of the 16th, and the cold wave advanced to the lower Missouri valley and the western Lake region during the 17th, with a temperature fall of 20 to 30, and zero temperature to Kansas. The a. m. report of the 18th showed a further fall of 20 to 30 in eastern Montana, and the lowest temperature of the month was reported over the Dakotas and eastern and northern Montana, a reading of -45 being recorded at Miles City, Mont.

The cold wave reached New York and western New England on the 19th, and overspread the entire country east of the Mississippi River and the eastern Lake region by the a. m. report of the 20th, with a 24-hour temperature fall of more than 40 in eastern New England, and a decrease of 10 to more than 20 in the middle and south Atlantic and east Gulf states. The lowest temperature of the month was reported generally from the Mississippi River to the middle and southern Rocky Mountain slopes on the 19th, and from the eastern Lake region to the east Gulf coast on the 20th. A cold wave of marked severity advanced from the Red River of the North to northern New England and the Canadian Maritime Provinces from the 22d to the 24th, with the lowest temperature of the month, -1, at Eastport, Me., on the 24th. The lowest temperature of the month occurred at points along the middle and north Pacific coasts on the 23d and 24th, and during the 24th the temperature fall exceeded 20 in Assiniboia. During the 25th the cold wave extended over the Lake region, the temperature fall being more than 30 in the Lake Superior district, and reached the Atlantic coast during the 26th, with a temperature fall of more than 30 in New England and Virginia. On the 27th the lowest temperature of the month was noted along the middle Atlantic, North Carolina, and New England coasts.

FROST.

The first heavy frost of the season was reported as follows: 4th, Jupiter, Micco, and Titusville, Fla. 14th, Galveston, Tex. 23d, Corpus Christi, Tex. The first light frost of the season

was observed at Jupiter, Fla., on the 3d; damage was caused to tender plants. Tender vegetation was injured by frost at Tampa, Fla., on the 3d. The heavy frost of the 4th caused considerable damage in the region about Titusville, Fla., the damage being largely confined to the west shore of the Indian River. At Jupiter, Fla., pineapples were protected in many places by the smoke of fires which were kept up for that purpose. Frosts from the 7th to 9th were very destructive to vegetation and pineapples about Jupiter. The observer

reports that owing to the timely cold-wave warning every precaution was taken to prevent injury to crops. Many persons kept fires burning for several nights, thereby lessening the damage to a great extent. Ice formed on the 8th at Jacksonville, Fla. On the 13th ice $\frac{3}{4}$ inch in thickness formed at Corpus Christi, Tex., and all vegetables were reported killed. The frost of the 13th, 16th, and 19th damaged wheat about Brady, Tex. The frost of the 14th and 19th killed vegetation about Galveston, Tex.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for January, 1892, as determined from the reports of about 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

In January the monthly precipitation is usually greatest on the extreme north Pacific coast, where it exceeds 10.00. At Neah Bay, Wash., 9 years' record, the normal amount for the month is 17.31. On the immediate Pacific coast north of the 40th parallel, and along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains, the average precipitation for January exceeds 8.00, and it is 4.00 to 6.00 generally along the Pacific coast north of the 37th parallel. The greatest precipitation over the eastern part of the country is noted at Hatteras, N. C., where the normal amount is 6.33; it is more than 4.00 along the immediate New England and middle Atlantic coasts, over east-central Florida, generally over districts south of the Ohio River and east of Texas, in central Utah, and in the mountains east of San Diego, Cal. From the Lake Superior region and the British Northwest Territory to the Rio Grande, Gila, and lower Colorado valleys the normal precipitation is less than 2.00, except over a part of the northern plateau and over the central part of the middle plateau; and from Minnesota, North Dakota, and eastern Montana to the Rio Grande River the normal amount is less than 1.00.

In January, 1892, the monthly precipitation was greatest at Montgomery, Ala., where it was 17.78; it exceeded 10.00 in south-central North Carolina, western South Carolina, northern Georgia, east-central and southeastern Alabama, extreme western Florida, southern Mississippi, south-central Louisiana, along the California coast between San Francisco and Eureka, and at Neah Bay, Wash.; and exceeded 8.00 on the west coast of Nova Scotia. Over a great part of the Rocky Mountain and plateau regions, from the west Lake Superior region and the extreme upper Mississippi valley to the northeastern slope of the Rocky Mountains, and in the Rio Grande Valley the monthly precipitation was less than 1.00. Over a part of the northern plateau the amount ranged from 2.00 to 6.00, and in central Arizona and central and northwestern Colorado it exceeded 2.00.

DEPARTURES FROM NORMAL PRECIPITATION.

The monthly precipitation was in excess of the January average in the Saint Lawrence Valley and the Canadian Maritime Provinces, generally in the Atlantic coast and east Gulf states, from the central upper lake region to Missouri, and from western Nebraska and western South Dakota to Arizona. The greatest excess in monthly precipitation was 12.80, at Montgomery, Ala.; the excess was 5.00 at Mobile, Ala.; it was more than 3.00 at Pensacola, Fla., Augusta, Ga., Baltimore, Md., and Yarmouth, N. S.; and was more than 2.00

along the west coast of the Gulf of Saint Lawrence, in the District of Columbia and a great part of Maryland, and from southern North Carolina to the middle Gulf coast.

The monthly precipitation was deficient on the Pacific coast, over the northern plateau and the north part of the middle plateau, from the northeast slope of the Rocky Mountains to the west Lake Superior region, in the middle Missouri valley, on the southeast slope of the Rocky Mountains, from the west Gulf states over the Ohio Valley and the south part of the Lake region, at points along the immediate south New England and middle and south Atlantic coasts, and over the south part of the Florida Peninsula. The most marked deficiency was noted at Olympia and Fort Canby, Wash., and Hatteras, N. C., where it was more than 4.00, and the deficiency was more than 2.00 over a great part of the Pacific coast, along the Mississippi and Ohio rivers from Memphis, Tenn., to Louisville, Ky., and on the extreme eastern coast of North Carolina.

Considered by districts the average percentage of the normal in districts where the precipitation was deficient was about as follows: southern plateau region, 230; east Gulf states, 175; upper Mississippi valley, 153; middle Atlantic states, 133; Missouri Valley, 121; south Atlantic states, 116; northeast slope of the Rocky Mountains, 115; New England, 114; upper lake region, 110; northern plateau region, 108. In districts where the precipitation was deficient the percentage of the normal was about as follows: Key West, Fla., 28; extreme northwest, 50; south Pacific coast, 51; southeast slope of the Rocky Mountains, 52; middle-eastern slope of the Rocky Mountains, 56; middle Pacific coast, 62; north Pacific coast, 64; Ohio Valley and Tennessee, 70; west Gulf states, 74; lower lake region, 89. The monthly precipitation averaged normal for the middle plateau region.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for January for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for January, 1892; (4) the departure of the current month from the average; (5) and the extremes for January during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of Jan.	(2) Length of record.	(3) Total for Jan., 1892.	(4) Departure from average.	(5) Extremes for Jan.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.		Inches	Years	Inches	Inches.	Inches.		Inches	
Lead Hill.....	Boone.....	3.02	10	.....	.....	7.37	1890	1.33	1887
California.									
Sacramento.....	Sacramento..	3.78	38	1.78	-2.00	15.04	1862	0.19	1889
Connecticut.									
Middletown.....	Middlesex...	4.41	30	.....	.....	9.24	1891	1.45	1876
Florida.									
Merritts Island..	Brevard.....	3.61	14	0.42	-3.19	10.45	1878	0.42	1892
Georgia.									
Forsyth.....	Monroe.....	5.26	18	9.59	+4.33	10.08	1883	2.22	1880
Illinois.									
Peoria.....	Peoria.....	1.73	34	1.25	-0.48	4.27	1862	0.30	1872
Riley.....	McHenry....	1.98	41	1.73	-0.25	5.96	1876	0.45	*

Deviations from average precipitation—Continued.

State and station.	County.	(1) Average for the month of Jan.	(2) Length of record.	(3) Total for Jan., 1892.	(4) Departure from average.	(5) Extremes for Jan.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Indiana.		Inches	Years	Inches	Inches.	Inches.		Inches	
Logansport	Cass	2.15	17	1.30	-0.85	5.69	1890	0.23	1881
Vevay	Switzerland	4.13	25	2.43	-1.70	9.03	1876	0.75	1872
Iowa.									
Grasco	Howard	1.37	20	0.57	-0.80	3.72	1886	0.38	1872, '84
Monticello	Jones	1.65	37	1.44	-0.21	3.77	1886	0.29	1865
Logan	Harrison	1.29	23	0.90	-0.39	3.10	1881	0.10	1872
Kansas.									
Lawrence	Douglas	1.29	27	0.83	-0.46	3.05	1878	0.12	1875
Wellington	Sumner	1.01	13			2.40	1890	0.18	1881
Louisiana.									
Grand Coteau	St. Landry	6.82	9	4.54	-2.28	13.30	1883	2.52	1887
Maine.									
Orono	Penobscot	4.72	22	4.80	+0.08	7.66	1891	2.00	1875
Maryland.									
Cumberland	Allegany	2.16	20	3.18	+1.02	3.90	1878	0.30	1887
Massachusetts.									
Amherst	Hampshire	3.43	56	5.41	+1.98	8.17	1891	0.99	1849
Newburyport	Essex	3.87	13	4.70	+0.83	7.76	1886	1.60	1875
Somerset	Bristol	4.56	19	4.98	+0.42	8.94	1891	1.57	1879
Michigan.									
Kalamazoo	Kalamazoo	3.37	16	1.20	-1.17	4.90	1876	1.10	1879
Thornville	Lapeer	3.01	15	1.41	-0.60	3.38	1890	0.58	1879
Minnesota.									
Minneapolis	Hennepin	1.19	26	0.66	-0.53	3.01	1886	0.06	1869
Montana.									
Fort Custer	Custer	0.80	12	1.31	+0.51	2.85	1884	0.08	1885
New Hampshire.									
Hanover	Grafton	2.93	47	3.37	+0.44	9.75	1851	0.31	1853
New Jersey.									
Moorestown	Burlington	3.51	28	5.64	+2.13	5.82	1882	1.13	1867
South Orange	Essex	4.39	20	6.70	+2.31	10.55	1891	1.17	1876
New York.									
Cooperstown	Otsego	3.56	38	4.99	+1.43	5.54	1891	0.32	1860
Palermo	Oswego	3.16	38			6.50	1874	0.16	1884
North Carolina.									
Lenoir	Caldwell	4.44	20	5.40	+0.96	9.60	1878	1.10	1890
Ohio.									
N. Lewisburgh	Champaign	3.77	20	1.00	-2.77	8.67	1876	0.44	1877
Wauseon	Fulton	3.34	18	1.43	-0.92	4.14	1890	1.29	1879
Oregon.									
Albany	Linn	8.52	15	5.27	-3.25	14.45	1867	2.22	1882
Eola	Polk	6.07	22	4.20	-1.87	16.68	1888	5.53	1875
Pennsylvania.									
Dyberry	Wayne	3.30	22	5.65	+2.35	5.65	1892	0.70	1872
Grampian Hills	Clearfield	3.75	21	3.49	-0.26	5.47	1888	1.21	1872
Wellaborough	Tioga	6.44	12	3.67	-2.77	12.17	1886	1.98	1890
South Carolina.									
Statesburgh	Sumter	3.48	10	6.65	+3.17	6.65	1892	0.90	1890
Tennessee.									
Austin	Wilson	5.57	23	3.47	-2.10	18.11	1882	2.66	1886
Texas.									
New Ulm	Austin	4.17	18	2.21	-1.96	10.56	1882	1.00	1887
Vermont.									
Stratford	Orange	3.64	18	4.20	+0.56	6.10	1891	1.70	1878
Virginia.									
Birdsnest	Northampton	3.76	23	5.50	+1.74	6.75	1882	1.00	1876
Washington.									
Fort Townsend	Jefferson	2.22	21	1.35	-0.87	4.65	1890	0.66	1859
Wisconsin.									
Madison	Dane	1.90	26	2.42	+0.52	3.65	1874	0.40	1878

* 1865, 1867, and 1872.

YEARS OF GREATEST PRECIPITATION FOR JANUARY.

The greatest precipitation ever reported for January was noted at Dyberry, Pa., Baltimore, Md., Statesburgh, S. C., Montgomery, Ala., Yuma, Ariz., and Walla Walla, Wash., in 1892, the absolute excess over the greatest amount previously reported varying from 0.15 at Yuma, Ariz., to 3.08 at Montgomery, Ala. In an area extending from central Arkansas over eastern Missouri, central Illinois, central Indiana, and central Ohio the greatest precipitation was reported in 1890; in an area extending from eastern Kentucky to the west Gulf coast in 1882; over northern California in 1878; and along the middle and lower Ohio river in 1876.

YEARS OF LEAST PRECIPITATION FOR JANUARY.

The least precipitation ever reported for January was noted at Merritts Island, Fla., Louisville, Ky., Toledo, Ohio, and Duluth and Saint Paul, Minn., the absolute deficiency below the least amount previously reported for January varying from 0.07 at Duluth, Minn., to 0.48 at Louisville, Ky. On the northeast slope of the Rocky Mountains the least precipitation for January was reported in 1891; on the Pacific coast north of the 38th parallel in 1889; from Arkansas and eastern Texas to the south Pacific coast in 1887; in the middle Mississippi and lower Missouri valleys in 1872 and 1881; and from the middle

Ohio river to the Atlantic coast between the 38th and 40th parallels in 1872.

EXCESSIVE PRECIPITATION.

The following tables show, by states, the number of stations reporting monthly precipitation to equal or exceed 10.00; precipitation to equal or exceed 2.50 in 24 hours; and precipitation to equal or exceed 1.00 in 1 hour in January, 1892:

Monthly precipitation to equal or exceed 10.00.

State.	Number of stations.	State.	Number of stations.
Georgia	8	Florida	1
Alabama	7	Mississippi	1
California	2	Louisiana	1
North Carolina	1	Washington	1
South Carolina	1		

Precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Alabama	20	11, 12, 13.	Florida	6	11-12, 12-13, 14, 14-15.
Louisiana	17	8, 10-11, 11, 11-12, 12, 13, 18-19.	Mississippi	5	10-14, 11, 12, 13.
Georgia	11	5-6, 10-13, 11-13, 12-13, 12-14, 18, 18-19.	North Carolina	3	12-13, 19.
California	6	1, 1-2, 26, 28-29.	Idaho	2	2-3, 28-29.
			South Carolina	2	28-29, 29.
			Michigan	1	1.
			Tennessee	1	13.

Precipitation to equal or exceed 1.00 in 1 hour.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Alabama	2	1, 11.			

Table of excessive precipitation, January, 1892.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.						
Auburn.....	Inches.	Inches.		Inches	h. m.	
Bermuda.....		2.59	13			
Brewton.....		3.06	12			
Carrollton.....	12.45	8.55	12-13			
Childersburgh.....		2.98	12-13			
Claiborne Landing.....		3.70	11-12			
Daphne.....		3.10	12-13			
Gadsden.....		5.62	11-12			
Livingston (a).....		2.80	12-13			
Mobile.....		3.51	12			
Montgomery.....		3.64	12-13	1.10	1 00	I
Mount Vernon Barracks.....	17.78	9.98	12-13			
Mount Willing.....		3.61	12			
Newton.....	12.55	5.00	12			
Oxanna.....		3.60	12			
Pushmataha.....	10.11	5.74	11-12			
Scottsboro.....		3.01	12			
Selma (a).....				1.06	1 00	II
Tallassee Falls.....	10.25	4.76	12-13			
Valley Head.....	12.77	5.10	12-13			
Wiggins.....		2.60	11-12			
California.						
Forestville.....	10.75	7.47	11-13			
Fort Ross.....		5.08	I			
Julian.....	10.86	8.20	1-2			
San Bernardino.....		5.50	28-29			
Upper Mattole.....		2.73	31			
Do.....	10.37	4.85	1-2			
Florida.						
Brookville.....		2.60	14			
Fort Barrancas.....	10.63	5.43	12-13			
Panadena.....		2.84	14			
Pensacola.....		2.52	11-12			
Tampa.....		2.75	14-15			
Tarpon Springs.....		2.50	14			
Georgia.						
Athens (a).....		3.00	18			
Athens (b).....	11.82	3.43	12-13			
Atlanta.....		3.15	12-13			

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Georgia—Continued.</i>						
Canton	12.59	8.95	10-13			
Diamond	11.87	6.07	12-13			
Elberton	11.94	3.10	18			
Hephzibah		2.50	5-6			
Marietta	10.66	5.22	12-14			
Monticello		2.92	18-19			
Point Peter	11.20	3.25	18			
Resaca	10.64	5.61	12-13			
Rome	11.69	6.83	13-11			
<i>Idaho.</i>						
Kootenai		3.00	2-3			
Do		3.00	28-29			
<i>Louisiana.</i>						
Abbeville	10.20	2.90	11			
Amite City		3.20	12			
Clinton		2.80	13			
Donaldsonville		2.95	13			
Farmerville		3.00	15			
Grand Coteau		3.50	12			
Jackson Barracks		5.72	11-12			
Jeanerette		3.45	8			
LaFayette		3.05	12			
Lake Charles		2.80	18-19			
Luling		3.43	11			
Maurepas		4.08	12			
New Orleans		2.80	10-11			
Paincourtville		4.50	11-12			
Plaquemine		2.50	12			
Roseland		3.26	12			
West End		2.80	13			
<i>Michigan.</i>						
Hart		2.50	1			
<i>Mississippi.</i>						
Batesville		3.20	11			
Bay Saint Louis	14.30	11.10	10-14			
Enterprise		2.96	13			
Logtown		3.10	12			
Meridian		3.04	12			
<i>North Carolina.</i>						
Concord	11.50	3.10	19			
Lenoir		2.80	12-13			
Murphy	10.04	3.80	12-13			
<i>South Carolina.</i>						
Belmont	10.45					
Columbia		2.93	18			
Evergreen		2.50	19			
<i>Tennessee.</i>						
Parksville		3.00	13			
<i>Washington.</i>						
Neah Bay	13.51	4.00	29			
Port Angeles		3.75	28-29			

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during January, 1892, for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
Atlanta, Ga.	Inch.		Inch.		Inch.	
Bismarck, N. Dak.	0.10	13	0.16	13	0.45	13
Boston, Mass.	0.10	2	0.17	2	0.47	2
Buffalo, N. Y.						
Cincinnati, Ohio						
Chicago, Ill.						
Cleveland, Ohio						
Denver, Colo.						
Detroit, Mich.						
Dodge City, Kans.						
Duluth, Minn.						
Eastport, Me.	0.10	7	0.15	7	0.32	19
Galveston, Tex.	0.04	8	0.07	8	0.20	8
Indianapolis, Ind.						
Jacksonville, Fla.	0.23	11	0.35	11	0.85	11
Jupiter, Fla.	0.15	18	0.20	18	0.60	18
Kansas City, Mo.						
Key West, Fla.	0.12	15	0.17	15	0.40	15
Marquette, Mich.						
Memphis, Tenn.						
New York, N. Y.	0.07	13	0.09	13	0.29	13
New Orleans, La.	0.13	11	0.18	11	0.74	11
Norfolk, Va.	0.05	15	0.10	15	0.30	15
Philadelphia, Pa.	0.03	13	0.06	13	0.25	13
Philadelphia Water Works	0.04	13	0.08	13	0.23	13
Pittsburg, Pa.						
Portland, Oregon	0.05	28	0.05	28	0.10	28
Saint Louis, Mo.						
Saint Paul, Minn.						
San Diego, Cal.	0.05	28	0.10	28	0.30	28
San Francisco, Cal.						

Maximum rainfall in one hour or less—Continued.

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
Savannah, Ga.	Inch.		Inch.		Inch.	
Washington, D. C.	0.14	6	0.23	6	0.28	14
Wilmington, N. C.	0.06	2	0.12	2	0.30	2
	0.10	14	0.18	14	0.50	14

*Self-register out of order.

†No record on account of snow.

The following tables show the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several states and territories for January during the last 22 years.

Excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
California	15	Ohio	1
Washington	14	South Carolina	1
Oregon	13	Arizona	0
Louisiana	8	Colorado	0
Georgia	8	The Dakotas	0
North Carolina	8	Delaware	0
New York	7	District of Columbia	0
Tennessee	7	Idaho	0
Alabama	7	Indian Territory	0
Texas	5	Iowa	0
Mississippi	5	Maine	0
Arkansas	4	Maryland	0
Indiana	3	Michigan	0
Massachusetts	3	Minnesota	0
Florida	3	Montana	0
Illinois	3	Nebraska	0
New Jersey	2	New Mexico	0
Virginia	2	Pennsylvania	0
Connecticut	1	Rhode Island	0
Kansas	1	Utah	0
Kentucky	1	Vermont	0
Missouri	1	West Virginia	0
Nevada	1	Wisconsin	0
New Hampshire	1	Wyoming	0

Excessive daily precipitation (24 hours).

Louisiana	14	Missouri	3
Tennessee	14	Arizona	2
North Carolina	13	Indian Territory	2
Texas	11	Maine	2
Georgia	11	Maryland	2
Florida	9	New Hampshire	2
Oregon	8	Utah	2
California	8	Delaware	1
Mississippi	8	Nebraska	1
Alabama	7	Nevada	1
Massachusetts	6	Vermont	1
New York	6	Idaho	1
Virginia	6	Michigan	1
Washington	6	Colorado	0
Arkansas	5	District of Columbia	0
Illinois	5	The Dakotas	0
Indiana	5	Kansas	0
Ohio	5	Minnesota	0
Pennsylvania	5	Montana	0
South Carolina	5	New Mexico	0
Kentucky	4	Rhode Island	0
New Jersey	4	West Virginia	0
Connecticut	3	Wisconsin	0
Iowa	3	Wyoming	0

Excessive hourly precipitation.

Illinois	2	Michigan	0
Texas	2	Massachusetts	0
California	1	Minnesota	0
Florida	1	Mississippi	0
Georgia	1	Missouri	0
North Carolina	1	Montana	0
Tennessee	1	Nebraska	0
Alabama	1	Nevada	0
Arizona	0	New Hampshire	0
Arkansas	0	New Jersey	0
Colorado	0	New Mexico	0
Connecticut	0	New York	0
The Dakotas	0	Ohio	0
Delaware	0	Oregon	0
District of Columbia	0	Pennsylvania	0
Idaho	0	Rhode Island	0
Indiana	0	South Carolina	0
Indian Territory	0	Utah	0
Iowa	0	Vermont	0
Kansas	0	Virginia	0
Kentucky	0	Washington	0
Louisiana	0	West Virginia	0
Maine	0	Wisconsin	0
Maryland	0	Wyoming	0

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for January during the last 22 years:

Monthly.

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
	Inches.			Inches.	
Upper Mattole, Cal.....	41.63	1888	Astoria, Oregon.....	22.16	1871
Do.....	33.40	1889	Iowa Hill, Cal.....	20.87	1889
Neah Bay, Wash.....	30.50	1874	Cisco, Cal.....	20.86	1881
Emigrant Gap, Cal.....	25.69	1881	Red Bluff, Cal.....	20.71	1878
Redding, Cal.....	22.69	1878	Calistoga, Cal.....	20.64	1878
Neah Bay, Wash.....	22.30	1887	Tatoosh L. H., Wash.....	20.50	1871
Ferndale, Cal.....	22.17	1889	Alta, Cal.....	20.00	1881

Daily (24 hours).

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Upper Mattole, Cal.....	31.68	27-31, 1888	Oxanna, Ala.....	5.74	11-12, 1892
Bay Saint Louis, Miss.....	11.10	10-14, 1892	Jackson Barracks, La.....	5.72	11-12, 1892
Montgomery, Ala.....	9.98	12-13, 1892	Shreveport, La.....	5.71	13, 1885
Canton, Ga.....	8.95	10-13, 1892	Fostoria, Tenn.....	5.70	14-15, 1885
Hydesville, Cal.....	8.86	26-31, 1888	Daphne, Ala.....	5.62	11-12, 1892
Brewton, Ala.....	8.55	12-13, 1892	Resaca, Ga.....	5.61	12-13, 1892
Point Pleasant, La.....	8.40	1-2, 1886	Clintonville, Ala.....	5.50	23-24, 1885
Fort Ross, Cal.....	8.20	1-2, 1892	Julian, Cal.....	5.50	26-29, 1892
Wiggins, Ala.....	7.47	11-13, 1892	Dale Enterprise, Va.....	5.49	8-9, 1886
Fort McDermitt, Nev.....	7.18	19-21, 1888	Mahanoy Plane, Pa.....	5.45	4-5, 1886
Emory Grove, Md.....	7.00	30, 1879	Fort Barrancas, Fla.....	5.42	12-13, 1892
Portland, Oregon.....	6.86	5-6, 1883	Cheneyville, La.....	5.40	20, 1891
Home, Ga.....	6.83	11-13, 1892	Pana, Ill.....	5.25	"
Greensborough, Ala.....	6.77	2-3, 1886	Marietta, Ga.....	5.22	12-14, 1892
Clarksville, Tex.....	6.50	—, 1875	Fulton, Ark.....	5.20	1, 1890
Marion, Ala.....	6.50	2-3, 1886	Cairo, Ill.....	5.17	17-18, 1876
Huntsville, Tex.....	6.45	3, 1890	Tallassee Falls, Ala.....	5.10	12-13, 1892
Jupiter, Fla.....	6.38	11-12, 1889	Kenton, Ohio.....	5.10	27-28, 1876
Lynchburg, Va.....	6.32	23, 1885	Forestville, Cal.....	5.08	1, 1892
Neah Bay, Wash.....	6.13	6-7, 1885	Tuscaloosa, Ala.....	5.00	2-3, 1886
Diamond, Ga.....	6.07	12-13, 1892	Delhi, La.....	5.00	22-23, 1887
Hephzibah, Ga.....	6.03	19-20, 1889	Point Pleasant, La.....	5.00	7-8, 1886
Fayette, Miss.....	6.00	6, 1883	Jeanerette, La.....	5.00	8, 1891
Fayetteville, N. C.....	6.00	8-9, 1879	Lake Charles, La.....	5.00	5, 1891
Houston, Tex.....	5.89	7-8, 1891	Mount Willing, Ala.....	5.00	12, 1892

* December 31, 1889-January 1, 1890.

One hour and less.

Station and state.	Amount.	Time.	Date.
	Inches.	A. M.	
Galveston, Tex.....	0.25	0 05	15, 1890
Key West, Fla.....	0.25	0 05	23, 1891
Jacksonville, Fla.....	0.23	0 05	17, 1892
Atwood, Ill.....	4.30	1 00	12, 1890

SNOW (in inches and tenths).

The first snow of the season was reported as follow: 2d, Valley Head, Ala.; Knoxville, Tenn. 5th, Marietta, Ga.; Montgomery, Ala. 6th, Atlanta, Columbus, Forsyth, and Lithia Springs, Ga.; Agricultural College, Louisville, Palo Alto, and Vicksburg, Miss.; Ashwood, Tenn. 7th, Americus, Canton, Resaca, and Rome, Ga. 8th, Mountain Home, Ala.; Gillsville, Ga. 9th, Decatur, Ala.; Toccoa and Waynesborough, Ga.; Liberty Hill, La. 11th, Batesville, Miss.; Haymond, Roby, Silver Falls, and Temple, Tex. 12th, Fort Smith, Ala.; South McAlester, Ind. T.; Shreveport, La.; Greenville, Miss.; Arlington, Austin, Gainesville, Graham, Mesquite, Mountain Spring, Odessa, and Palestine, Tex. 13th, Emilie, La.; Washington, Miss.; Nacogdoches, Tex.

14th, Bermuda and Mobile, Ala.; Fort Barrancas and Pensacola, Fla.; Albany, Blakely, Millen, and Poulan, Ga.; Houma, Luling, and New Orleans, La.; Enterprise, Meridian, Pearlinton, and Ship Island, Miss. 15th, Louisville, Ga.; Waynesborough, Miss. 17th, Healdton, Ind. T.; Lawrence, La.; Mayersville, Miss.; Brady, Childress, Colorado, College Station, Highland, Kent, Quanah, and Wichita Falls, Tex. 18th, Port Gibson, Miss.; Big Spring, Brownwood, Burnet, Corpus Christi, Forestburgh, Haskell, Menardville, New Braunfels, Round Rock, and San Angelo, Tex. 19th, Coushatta and Marksville, La.; Canton, Duck Hill, Fayette,

Vaiden, and Yazoo City, Miss.; Cuero, Durham, Duval, Galveston, and Hallettsville, Tex. 20th, Fredericksburg, Tex. 21st, Fort Apache, Ariz. 23d, Helena, Ark.

In New England the monthly snowfall was below the average, and in the southern sections it afforded little protection to crops. On the 15th a depth of 1 to 15 inches was reported over a considerable part of New England. In southern Calvert county, Md., the only heavy snow of the month fell on the 15th, and it remained on the ground so short a time that it was of no practical benefit to crops. In central North Dakota the snow of the latter part of the month was insufficient to afford protection to crops.

On the 1st a snowstorm extended from Iowa over the upper lake region, a depth of 12.6 being noted at Marquette, Mich. Snow continued over the Lake region during the 2d, and a heavy fall of snow was reported on that date in southern and western Colorado. A heavy snowstorm prevailed over South Dakota on the 6th; heavy snow also occurred in the middle Atlantic states and along the New England coast on that date; at Buffalo, N. Y., a depth of 17 was noted. Owing to heavy snow drifts no trains arrived at Bismarck, N. Dak., on the 8th. At Chattanooga, Tenn., a depth of 10 was reported on the 9th, and trains were delayed. Heavy snow fell in parts of Nebraska, Kansas, and Indian and Oklahoma territories on the 10th; a heavy snowstorm was also reported in southeastern Virginia.

On the 12th snow and sleet fell to a depth of 3.5 at Memphis, Tenn. Heavy snow was reported in southern Indiana on the 13th, and from the 12th to 14th a depth of 6.2 was noted at Cincinnati, Ohio, the heaviest snowfall at that place in several years. Light snow was general in Louisiana on the 13th and 14th. The snowstorm reached the Atlantic coast on the 15th, a depth of 4 to 9 being reported in Maryland and Virginia, and the snowfall was heavy thence over New England. A severe snowstorm set in over Kansas and Nebraska on the 17th, and extended over the Ohio Valley by the 18th. From the 17th to 19th a depth of 10 was reported at Springfield and Saint Louis, Mo., and in parts of Iowa and Missouri drifted snow delayed trains. The snowstorm extended over the west Gulf states and the Lake region during the 18th. A depth of 2.50 was noted at Austin, Tex., and 2 fell at Coushatta, La. Sleet changed to snow at Abilene, Tex., and sleet in the form of snow pellets fell at San Antonio, Tex. Heavy snow interrupted railroad traffic in the lower lake region. On the 19th the snow area extended over Mississippi.

MONTHLY SNOWFALL.

The depth of snowfall for the month, as reported by regular and voluntary observers of the Weather Bureau, is shown on Chart V. The greatest depth of snowfall reported was 71, at Atlantic, Mich.; 70 was noted at Flagstaff, Ariz.; 62 at Constableville, N. Y.; 51 at Cisco, Cal.; 50 at Elk City, Idaho; 41 at Saegerstown, Pa.; 34 at Cumbres, Colo.; and 31 at Siskiyou, Oregon. The monthly snowfall exceeded 20 in northern New England, northern, central, and western New York, along the shores of the lower lakes, in northeastern and western Lower Michigan, and northern Upper Michigan; and it exceeded 10 generally in the middle Atlantic and New England states, in the Ohio Valley north of the Ohio River, in areas in the middle and upper Mississippi valley, along the eastern slope of the Rocky Mountains north of the 40th parallel, in the mountain regions of Idaho, Washington, Oregon, and northern California, and in areas in Nevada, Utah, and Colorado. Snow fell as far south as the immediate middle and west coasts of the Gulf of Mexico, to the Rio Grande River in western Texas, and in the mountains of extreme southeastern Arizona.

Snowfall of 10 inches, or more, was reported as follows, and in states and territories where the maximum depth was less than that amount the station reporting the greatest is given: *Alabama*.—Decatur, 4.5. *Arizona*.—Flagstaff, 70; Crittenden, 11. *Arkansas*.—Harrison, 14; Black Rock, 11; Newport (a),

10.3; Harrisburgh, Marshall, and Rogers, 10. *California*.—Cisco, 51; Emigrant Gap, 41.5; Summit, 40; Truckee, 26.5; Dunsmuir, 20; Sisson, 19.5; Towles, 18; Delta, 14.5; Shasta, 13; Walla Walla Creek, 12; Susanville, 10.5. *Colorado*.—Cumbres, 34; Climax, 28; Jefferson, 26.3; Meeker, 20; Ward District, 19.8; Pagoda (near), 19; Platoro, 17.8; Steamboat Spring, 17; Dillon, 16; Red Cliff, 14.5; Lay, 13.3; Smoky Hill Mine, 13; Greenhorn, 12.5; Delta, 12; Box Elder and Rico, 10.

Connecticut.—New Hartford (a), 18; Wallingford, 17; Hartford (b), 15; Falls Village, New Hartford (b), New Haven, Waterbury, and West Simsbury, 14; Southington and South Manchester, 13; Canton, Mansfield, and North Grosvenor Dale, 12; Stevenson, 11; Lebanon, Norwalk (b), and Voluntown, 10. *Delaware*.—Dover, 9.5. *District of Columbia*.—Washington, 20.5. *Florida*.—Pensacola, 0.5. *Georgia*.—Diamond, 3. *Idaho*.—Elk City, 50.5; Henrys Lake, 30; Garden Valley, 18.5; American Falls, 15.5; Ruthburg, 14.5; Boise Barracks, 14. *Illinois*.—Mascoutah, 27; Greenville, 23.1; Pana, 19.3; Alton, Flora, and Irishtown, 18; Louisville and White Hall, 17.5; Carlinville and Rockford, 16.8; Cairo and Fairmount, 16.5; Martinsville, 16; Chicago, 15.3; Philo, 14.6; Olney (a), 14.2; McLeansborough and Winnebago, 14; Charleston, 13.9; Beason and Jordans Grove, 13.5; New Haven, 13.2; Palestine, 12.2; Mattoon, 12; Springfield, 11.9; Havana, 11.5; Warsaw, 11; Aurora (a), 10.

Indiana.—Angola, 19.9; Delphi, 16.5; La Fayette, 16.2; Michigan City and Princeton, 16; Vevay, 14.1; De Gonia Springs, 14; Columbia City and Mount Vernon, 13.5; Marenco, 13.2; Marion, 12.9; Point Isabel and Terre Haute, 12.5; Huntington and Mount Vernon (a), 12; Farmland, 11.8; Butlerville, 11.5; Indianapolis, 10.9; Worthington and Jeffersonville, 10.6; Huntingburgh, 10. *Indian Territory*.—Eufaula, 6.8. *Iowa*.—Mason City, 20; Dubuque, 14.5; Mechanicsville, 13.8; McCausland, 13.2; Belle Plaine, Fort Madison, and Richland, 13; Fairfield and Muscatine, 12; Iowa City, 11.8; Davenport, 11; Des Moines, 10.4; Blakeville, 10.2. *Kansas*.—Seneca, 14; Leavenworth, 12.6. *Kentucky*.—Pellville, 11; Shelbyville, 10.9; Fort Thomas, 10.7. *Louisiana*.—Shreveport, 3.

Maine.—Indian Stream, 28; Kents Hill, 21; Calais, 20; Farmington, 19; Orono, 18.5; East Machias, 18; Cornish, 17.5; Kennebec Arsenal, 16.4; Fairfield, 16; Eastport, 15.2; Belfast, 14; Portland, 13.1. *Maryland*.—Fallston, 15; Baltimore, 14.5; Frederick, 13.2; New Market, 11.8; Fort McHenry, 10.7. *Massachusetts*.—Monroe, 21; Kendall Green, 19; Florida (b), Ludlow (a), and Mount Nonotuck, 18; Gilbertville, 17; Fitchburgh (a), North Billerica, and Monson, 14; Amherst Experiment Station (a and b), Chicopee, and Springfield Armory, 13; Dudley, 12.2; Amherst, Boston, Fitchburgh (b), Lawrence, Leominster, Salem (b), Wakefield, and Westborough, 12; Roxbury and Williamstown, 11; Concord, 10.5; Groton (a) and South Hingham, 10.

Michigan.—Atlantic, 71; Sand Beach, 54; Calumet, 44; Weldon Creek, 40.3; Harbor Springs, 37; Marquette, 27.4; Sault de Ste. Marie, 27; Bear Lake, 26.9; Hanover, 25.5; Manistee, 24.9; Fitchburgh, 24.5; Grand Haven, 24.2; Harrisville, 24; Benzonia, 22.7; Standish, 21.1; Caldwell and Jeddo, 21; Fairview, 20; Cheboygan, 19; Alma and May, 18.5; Fort Mackinac, 18.2; Fremont and McMillan, 18; Albion and Vandalia, 17.8; Detroit, 17.2; Lathrop, 17.1; Saint Ignace, 17; Howell, 16.5; Grape, 16.2; Eden, Grand Rapids, Hart, Saint Johns, and Thornville, 16; Hudson, Ivan, and Kalamazoo, 15.5; Marshall, 15.1; Lansing, 14.7; Allegan and Rawsonville, 14.5; Fort Wayne, 14.2; Ball Mountain, 13.8; Berlin, 13.7; Port Huron, 13.5; Birch Run, 13.3; Ypsilanti, 12.9; Bronson, 12.8; Arbela, 12.5; Highland Station, 12.2; Adrian, Noble, and Ovid, 12; Parkville, 11.5; Alpena, Ann Arbor, and Madison, 11.3; Grayling, 11; Harrison, 10.5; Bellaire, 10.2; Benton Harbor, 10.1; Flint, Hayes, and Washington, 10.

Minnesota.—Lake Winibigoshish, 7.8. *Mississippi*.—Vicks-

burg and Booneville, 5. *Missouri*.—Fox Creek, 29; Jefferson Barracks, 24.6; New Haven, 22; Jerome, 20; Steelville, 18.5; Saint Charles (b), 16; Zeitonia, 14.5; Chillicothe (a), Darksville, Phillipsburgh, Saint Louis, Springfield, and Warrenton, 14; Marble Hill, 13.5; Harris, 13; Oregon (a), 12.9; Lebanon and Rolla, 12; Withers Mills, 11.5; Glasgow and Princeton, 11; Eldon, Excelsior Springs, Gordonsville, Hermann, and Oregon (b), 10. *Montana*.—Fort Missoula, 15.5; Fort Custer, 13.1; Helena, 11. *Nebraska*.—Fairbury, 22; Alliance, 17.8; Ansley, 17; Ravenna, 16.3; Hay Springs, Minden, and Pawlet, 15.5; Hayes Centre, 14.8; Fort Robinson, 14.7; Lexington, 14; Grant and Weeping Water, 13.5; Hastings, 12; Wallace, 11.2; North Platte, 10.2; Auburn (a) and Tecumseh, 10.

Nevada.—Tuscarora, 16; Palisade, 13; Cranes Ranch, 10. *New Hampshire*.—Berlin Mills, 26.5; Stratford and West Milan, 24; Littleton, 19; Concord (a), 14.8; Antrim, 14; Nashua, 13.5; Manchester, 12.2; Peterborough, 12; North Conway, 11; East Canterbury and Hanover (a), 10. *New Jersey*.—Dover, 19.7; Oceanic, 17.5; Highland Park and New Brunswick, 16.8; South Orange, 16.5; Tenafly, 16; Junction, 15.4; Belleville, 15; Bayonne, 14.9; Somerville, 14.5; Rancocas, 14.3; Belvidere, 14; Blairstown, 13.5; Deckertown, Lambertville, and Newark, 13; Beverly, 12.6; Locktown, 12.5; Camden and Newton, 12; Moorestown, 11.7; Gillette, 11; Salem, 10. *New Mexico*.—Coolidge, 16.5; Chama, 11.

New York.—Constableville, 62; Eden Centre, 59.5; Number Four, 53.8; Potsdam, 52; Turin, 51; Fort Porter, 48.2; Le Roy, 48; Buffalo, 46.6; Utica, 42.5; Malone, 42.2; Sherman, 38.5; Hess Road Station, 37.6; Humphrey, 33.5; Oswego, 31.7; Brookfield, 31.5; Albion, 29.8; Canton, 28.2; Perry City, 26.9; Plattsburgh Barracks, 27.5; Geneva, 27.2; Lyons, 27; Arcade, 26.8; Rochester, 26.4; Lockport, 25; South Canisteo, 24.8; North Hammond, 24; Fort Schuyler, 23; Angelica, 22; Madison Barracks, 21.6; Fleming and Romulus, 20; Ithaca, 19.9; Victor and West Point, 19.5; Alfred Centre, 18.5; Fort Wadsworth, 18; Cooperstown, 17; Oxford, 16.8; Factoryville and Honeymead Brook, 16.4; New Lisbon, 15.5; Port Jervis, 13; Boyds Corners, 14.8; Addison, 14.5; Jamestown, 14; Glens Falls, 13.8; New York, 13.1; Binghamton and Middletown, 13; Albany, 10.

North Carolina.—Oak Ridge, Salisbury, and Saxon, 8. *North Dakota*.—Napoleon, 14. *Ohio*.—Bement, 27; Orangeville, 25; Oberlin, 24.4; Wooster, 22.2; Weymouth, 22; Cleveland, 20.5; Carrollton, 20.2; Wauseon, 19.2; Gratoit and Harbor, 19; Akron, 18.7; Marion, 18.2; Ashland, 18; Westerville, 16.8; Youngstown, 16.4; Tiffin, 16.2; Bangorville and Van Wert, 16; Sandusky, 15.8; Canton, 15.3; Elyria, 15.1; Fostoria and Montpelier, 15; Kenton and Upper Sandusky, 14; Waynesville, 13.9; New Alexandria and Toledo, 13.5; Napoleon, Springborough, and Logan, 13.4; Wapakoneta, 13.1; Granville, 12.9; Columbus, Dayton, and Findlay, 12.5; Lordstown and Clarksville, 12; Newcomerstown, 11.5; Celina, Georgetown, and North Lewisburgh, 11; Bellevue, 10. *Oklahoma Territory*.—Oklahoma City, 5. *Oregon*.—Siskiyou, 31.

Pennsylvania.—Saegerstown, 40.6; Blue Knob, 32.5; Erie, 27; Corry, 20; Salem Corners, 19.9; Wilkes Barre, 18.5; Coatesville, 18.2; Clarion, 17.4; Lock Haven, 17.3; Eagles Mere, 16.4; Easton, 16.1; Grampian Hills, Somerset, Stoyestown, and Wellsborough, 16; Ligonier and New Castle, 15.5; Pottstown, 15; Pleasant Mount, 14.9; Drifton, Kennett Square, and Quakertown, 14; Girardville, Swarthmore, and Lebanon, 13.5; Coopersburgh, 13.2; York, 13; Westtown, 12.9; Dyberry, West Chester, and Emporium, 12.5; Le Roy, 12.4; Honesdale, Hulmeville, and Uniontown, 12; Philadelphia, 11.2; Frankford Arsenal, 11; South Eaton, 10. *Rhode Island*.—Providence (c), 8. *South Carolina*.—Belmont, 1. *South Dakota*.—Oelrichs, 25.5; Fort Meade, 12.4; Cross, 11.9; Webster, 10.9. *Tennessee*.—Chattanooga, 10.8. *Texas*.—Arthur City and Silver Falls, 6. *Utah*.—Ogden (a), 17; Blue Creek, 15; Salt Lake City, 13.8; Provo City, 13; Promontory, 10.

Vermont.—Lunenburg, 27; Enosburgh Falls, 23; Burlington and Chelsea, 22; Strafford, 19; Northfield, 16.2; Jacksonville, 16; Brattleborough (a), 15.5; Cornwall, 14; Vernon, 13; Wells, 12. *Virginia.*—Lynchburgh, 17.2; Lexington, 15.7; Blacksburgh, 15; Nottoway C. H., 14.2; Richmond and Staunton, 14; Charlottesville, 12.5; Christiansburgh, 12; Dale Enterprise, 11.5; Salem, 11.4; Avon, 10.2. *Washington.*—Spokane, 13.1; Chelan, 11.3; Walla Walla, 10.7. *West Virginia.*—Parkersburgh, 21.2; Elkhorn, 16.2; Charleston, 14; Tannery, 13.2; Nuttallburgh, 12; Ella, 10.2; Harpers Ferry, 10. *Wisconsin.*—Crandon and Beloit, 20.1; Green Bay, 15.1; Kenosha, 15; Florence and Harvey, 13.9; Bayfield, 13.5; Embarrass, 13; Peshtigo, 12.6; De Pere, 12.5; Prairie du Chien, 12.4; Appleton, 12; Oconto, 11.7; Oshkosh, 11.2; Manitowoc, 11.1; Fond du Lac, 11; Cadiz, 10.6; Koepenick, 10.5; Lancaster and Portage, 10. *Wyoming.*—Sundance, 21.5; Fort Yellowstone, 14; Fort McKinney, 10.2.

DEPTH OF SNOW ON GROUND ON 15TH AND AT THE CLOSE OF THE MONTH.

Chart VI shows the depth of snow on the ground at the close of the month, as reported by regular and voluntary observers of the Weather Bureau.

On the 15th a depth of more than 10 was reported in extreme northern New England, central and western New York, eastern and western Lower Michigan, Upper Michigan, eastern North Dakota, over the east part of the middle plateau region, and from western Utah over the northern plateau region. The greatest depth was reported over southern Idaho, where it varied from 15 to 30, and in the mountains of Colorado, extreme northern Upper Michigan, and northeastern North Dakota, where it exceeded 30. A depth of 5 to 6 was reported in northern Arkansas, and trace to 0.5 on the middle Gulf coast.

At the close of the month a depth of 20 to 30 was noted at points in Idaho, Colorado, North Dakota, Upper Michigan, and New York; more than 10 over the northern plateau region and the north and east parts of the middle plateau, in eastern North Dakota, and in areas in the Lake region, New York, and northern New England, and trace of snow was reported as far south as Tennessee and central New Mexico.

HAIL.

Description of the more severe hailstorms of the month is given under "Local storms." Hail was reported as follows: 1st, Arkansas, Missouri, and Washington. 2d, Pennsylvania.

5th, Alabama, Georgia, Mississippi, and Tennessee. 6th, Georgia and Florida. 7th, Alabama. 9th, Alabama, Georgia, and Louisiana. 10th, Missouri. 11th, Louisiana and North Carolina. 12th, Alabama, Louisiana, and Mississippi. 13th, Nevada, Oregon, and Texas. 14th, Louisiana and Mississippi. 15th, North Carolina. 17th, Florida. 18th, Georgia and Texas. 19th, Louisiana and Texas. 20th, North Carolina. 24th, New Mexico. 26th, California. 29th, Arizona. 30th, Arizona, New Mexico, and Wisconsin. 31st, Arizona and New Mexico.

SLEET.

Description of the more severe sleet storms of the month is given under "Local storms." Sleet was reported as follows: 1st, Iowa, Kentucky, Michigan, Missouri, New York, and Vermont. 2d, Michigan, New York, and Ohio. 3d, New Hampshire. 4th, Ohio. 5th, Virginia. 6th, Alabama, Connecticut, Massachusetts, Mississippi, Nevada, New York, Pennsylvania, Texas, and West Virginia. 7th, Georgia, Nevada, and Texas. 8th, Arkansas. 9th, Alabama, Georgia, Mississippi, and South Carolina. 10th, Arkansas, Kentucky, Louisiana, Mississippi, Missouri, and North Carolina.

11th, Arkansas, Illinois, Indiana, Kentucky, Louisiana, Mississippi, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, and Vermont. 12th, Arkansas, Indiana, Kentucky, Louisiana, Maine, Michigan, Mississippi, New York, Ohio, Pennsylvania, Tennessee, Texas, and West Virginia. 13th, Arkansas, Indiana, Kentucky, Louisiana, Maine, Mississippi, New York, Ohio, Tennessee, Texas, and West Virginia. 14th, Georgia, Louisiana, Mississippi, Ohio, Tennessee, Texas, and West Virginia. 15th, Connecticut, Georgia, Maine, Massachusetts, New Jersey, New York, North Carolina, and Virginia. 16th, Kentucky. 17th, Arkansas, Florida, Pennsylvania, and Texas.

18th, Arkansas, Connecticut, Kentucky, Louisiana, Mississippi, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Texas, Vermont, and West Virginia. 19th, Alabama, Colorado, Connecticut, Louisiana, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Texas, Vermont, and West Virginia. 20th, Georgia, Louisiana, New Jersey, North Carolina, and Virginia. 21st, Texas. 23d, Ohio. 24th, Virginia. 25th, Kentucky. 27th, Maine. 29th, Ohio, Pennsylvania, and Utah. 30th, Massachusetts, Michigan, New Mexico, and Ohio. 31st, Colorado, Nebraska, New Mexico, and South Dakota.

WINDS.

The prevailing winds in January, 1892, are shown on Chart II by arrows flying with the wind. In New England and on the middle-eastern slope of the Rocky Mountains northwest to north winds were most frequently noted; in the middle Atlantic states, the Ohio Valley and Tennessee, the upper lake region, the upper Mississippi valley, and on the northeastern slope of the Rocky Mountains they were generally from southwest to northwest; in the south Atlantic states and the Missouri Valley, from west to north; over the Florida Peninsula, in the east Gulf states, over the middle plateau region, and along the south Pacific coast, from northwest to northeast; in the west Gulf states, from the north; in the lower lake region and on the southeast slope of the Rocky Mountains, from south to west; in the extreme northwest, from west to northwest; over the northern plateau region, from southeast to south; on the north Pacific coast, from east to south; and over the southern plateau region and on the middle Pacific coast, variable.

HIGH WINDS.

(In miles per hour.)

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows: 1st, 60, nw., at Chicago, Ill.; 52, nw., at Milwaukee, Wis.; 50, se.,

at Lexington, Ky. 2d, 55, w., at Chicago, Ill. 6th, 60, e., at Block Island, R. I.; 50, e., at Tatoosh Island, Wash. 10th, 52, ne., at Kitty Hawk, N. C. 15th, 53, n., at Kitty Hawk, N. C. 19th, 56, s., at Huron, S. Dak. 21st, 55, sw., at Buffalo, N. Y. 25th, 69, se., at Fort Canby, Wash.; 66, e., at Tatoosh Island, Wash. 26th, 56, se., at Fort Canby, Wash.; 55, nw., at Atlantic City, N. J.; 54 nw., at Block Island, R. I.; 54, nw., at Woods Holl, Mass. 27th, 56, nw., at Woods Holl, Mass. 28th, 60, s., at Fort Canby, Wash. 29th, 61, s., at Fort Canby, Wash. 30th, 65, ne., at Block Island, R. I.

LOCAL STORMS.

1st.—Stormy weather prevailed from the upper lake region to Texas. At Marquette, Mich., rain changed to snow 11.50 a. m. A strong west gale began 6.45 p. m., and continued during the 2d, with maximum velocity 44 miles per hour from the northwest at 8.15 a. m., 2d. Amount of snowfall, 12.6 inches. At Detroit, Mich., a gale set in 9.12 a. m. Rain began at night, changing to sleet the morning of the 2d and to snow in the afternoon. The maximum wind velocity, 42 miles per hour from the southwest, was noted 4.32 a. m., 2d. The severest storm of the season was reported at Milwaukee, Wis. Rain fell during the day and snow at night. Steamers

remained in port, and some damage was caused to vessels in the harbor. A snowstorm, with a rapid fall in temperature, set in over central and northern Illinois in the afternoon. At Charleston, Ill., the temperature fell 33° in 6 hours.

A storm of snow and sleet, with rapidly falling temperature and high wind, prevailed over eastern Iowa. At Davenport, Iowa, a thunderstorm from the west began shortly after midnight. The temperature continued high with light southerly wind until 8 a. m., when the wind veered to northwest and increased in force, with a rapid fall in temperature in the early afternoon. Sleet began 1.45 p. m., and changed to snow, which continued during the day. Drifted snow caused a blockade on the electric street railway, and damage was caused to electric wires. The storm was also severe in northeast Kansas and northwest Missouri. A severe storm was reported at Mayfield, Ky., in the morning. At Chattanooga, Tenn., the pressure decreased rapidly; in the afternoon the wind reached a velocity of 36 miles per hour from the southeast, and 0.91 inch of rain fell in 45 minutes.

A thunderstorm from the southwest, with heavy rain, hail, and vivid lightning, struck Little Rock, Ark., about 5 a. m. The wind reached a velocity of 36 miles per hour, with an extreme velocity of 58 miles, damaging trees, etc. Destructive storms were also reported at Texarkana, Arkansas City, and Pine Bluff. At Grand Cane, La., a high wind at 2 a. m., lasting about 5 minutes, prostrated trees and fences. At Palestine, Tex., a heavy wind and rain storm from the west began 12.05 a. m. The wind reached a velocity of 60 miles per hour for a few minutes, blowing down two buildings and causing other damage. The gale continued about 30 minutes. A report from Red Bluff, Cal., stated that trains were delayed by heavy snow in the mountains.

2d.—Severe storms prevailed from the Lake region to the New England coast. At Boston, Mass., rain fell in the afternoon, and the wind reached a velocity of 39 miles per hour from the southeast. A southeast gale and rain prevailed at Woods Holl, Mass., in the afternoon. A heavy storm raged over Long Island Sound and southern New England. A heavy rainstorm, with high south wind, prevailed at Philadelphia, Pa., in the morning. A second wind and rain storm occurred in the evening. At Buffalo, N. Y., a southwest gale, with snow, prevailed during the afternoon and at night, the wind attaining a velocity of 48 miles per hour at 2.35 p. m. The severest storm of the season was reported at Sault de Ste. Marie, Mich. Rain changed to snow in the early morning, and ended 3.45 p. m. High northeast backing to northwest winds were attended by a temperature fall of 39° in 24 hours, and snow drifted to a depth of 3 feet. At Manistee, Mich., the wind reached a velocity of 60 miles per hour from the northwest. At Grand Haven, Mich., the wind veered to northwest after midnight and increased to a gale, with snow. At Chicago, Ill., snow fell in the morning, and high winds prevailed, reaching a velocity of 55 miles per hour from the west. A heavy snowstorm was reported in southern and western Colorado. At Key West, Fla., the wind changed from southwest to northwest at 1.45 p. m., and increased to 32 miles per hour at 6 p. m. Strong to high northwest wind continued during the 3d, a velocity of 38 miles per hour being reached at 12.20 p. m. The barometer continued high and rising, with decidedly lower temperature, the evening of the 3d.

5th.—Severe local storms were reported in Alabama, Georgia, and South Carolina. At Auburn, Ala., the morning was cloudy, with rain. In the evening sheet lightning, with low, muttering thunder, occurred in the northwest, and from 10 p. m. until 1 a. m., 6th, heavy rain, with lightning and loud thunder, prevailed. The next day a tornado was reported in the east-central part of the state. It passed through northern Chambers and southern Randolph counties, seriously injuring several persons, and causing considerable damage to property. About 6 p. m. a destructive tornado moved southeast over Fayetteville, Ga. The storm was first observed in the northwest as a blue-black cloud. Shortly before 6 p. m.

there was a dead calm, and a peculiar roaring sound was heard as the storm cloud approached. The cloud assumed a funnel shape; the outside of the cylinder appeared fringed with fire, and the interior appeared a black, seething mass. It bounded like a huge ball, and demolished objects at points where it touched the earth. When it struck the earth the cloud appeared to be shaken and rent asunder; it would rise and apparently renew its strength, and again descend to the earth. The path of destruction was about 200 yards in width, and the passage of the tornado was followed by heavy rain. Three persons were reported killed; a number of persons were seriously injured; 30 buildings were destroyed, and many other buildings were damaged. The estimated damage to property was \$30,000 to \$50,000.

Late in the afternoon a tornado was reported 3 miles west of Millen, Ga. The path was reported about 200 yards in width, and a number of buildings were destroyed. At Atlanta, Ga., rain began 10.30 p. m., and at 10.35 p. m. the wind reached a velocity of 45 miles per hour, with heavy rain. A heavy thunderstorm then set in and continued until nearly midnight. About midnight a tornado, moving from the northwest, occurred at Cashs Depot, in the north part of Darlington county, S. C. The storm was attended by lightning; several persons were injured; and a number of buildings were demolished.

6th.—Severe local storms occurred in Florida and Georgia, and a wind and snow storm prevailed over the middle Atlantic and New England states. A tornado passed about one mile south of Oakland, Fla., at 11 a. m. It moved east by north and changed course to east by south, and was attended by a roaring or rushing sound. Heavy rain fell during and after its passage, and hail was reported some miles to the westward. The display of thunder and lightning about equaled that observed in a summer storm. One woman was killed, and property was destroyed to the value of about \$1,000. The storm was first observed as two dark hanging clouds, which apparently united. After the clouds met a whirling tornado cloud formed and moved eastward. Its action in an orange grove indicated converging winds from two directions, and beyond that point trees were generally blown in the direction of the storm's movement and fell somewhat towards the center of the path. After crossing Johns Lake the storm cut a path about 100 yards in width and prostrated trees in a path 230 yards in width. The path narrowed to 30 to 40 yards in width. The funnel did not appear to touch the ground, but was observed to lower from, and rise to, the cloud. In the morning a waterspout was seen on Lake Apopka, northeast of the track, and a tornado was reported at Tavares, Fla. A violent thunderstorm passed over Augusta, Ga., between 1 and 2 p. m.; rain fell in the city, and hail 3 miles to the westward. The wind was high from the south, becoming variable. The temperature fell from 63° to 46°, and the pressure was 29.20 (actual) at 2.20 a. m. At Wilmington, N. C., a southwest wind, with rain, increased to a gale at 1.40 a. m., and reached a velocity of 46 miles per hour at 5.10 a. m. The pressure decreased rapidly, and at 2 p. m. the reduced reading was 29.39; after which the wind shifted to west, and the barometer commenced to rise. A heavy snowstorm prevailed over Virginia, Maryland, and eastern Pennsylvania, and high north to east gales, with snow, prevailed along the middle Atlantic and New England coasts. Snow fell to a depth of 17 inches at Buffalo, N. Y., delaying trains. Snow fell at Buffalo on the 7th, and high winds continued at that place until the 9th.

9th.—An unusually heavy snowstorm prevailed over parts of Tennessee and the east Gulf states.

10th.—A heavy snowstorm prevailed from Nebraska to northern Texas, and in Virginia.

11th.—Very heavy rain commenced in the Etowah and Oostanaula valleys, Georgia, and continued until the 14th, the rainfall during this period being 7 and 9 inches at Rome and Resaca, respectively. At Memphis, Tenn., sleet began in the early morning and continued, at intervals, with snow during

the 11th and 12th, interrupting traffic. At Nashville, Tenn, rain alternated with sleet.

12th.—Heavy rain, with sleet, prevailed in Tennessee and in parts of the middle and east Gulf states on the 12th and 13th, and this condition extended over the Ohio Valley, the lower lake region, and the middle Atlantic coast during the 14th.

15th.—A heavy snowstorm prevailed in the Atlantic coast states from North Carolina to Maine.

17th.—A heavy snowstorm set in over the middle Mississippi and lower Missouri valleys, and extended over the Ohio Valley and the middle and west Gulf states during the 18th and 19th.

21st.—Snow, and a southeast gale reaching 55 miles per hour, prevailed at Buffalo, N. Y.

25th.—High southerly winds prevailed along the Pacific coast. At Eureka, Cal., the barometer fell one-third inch in the 12 hours preceding 8 a. m. The wind increased to a gale from the south at 8.30 a. m., and continued high until noon, causing slight damage to property; rain fell in the afternoon. Some damage was caused to buildings in San Francisco, Cal., by high wind.

26th.—A severe northwest gale prevailed from Virginia to the south New England coast, and continued during the 27th. At Cape Henry, Va., the wind reached a velocity of 50

miles per hour at 10.50 a. m., and continued high during the 27th. A three-masted schooner was driven ashore, but was floated off by a wrecking vessel after the gale subsided. At Yuma, Ariz., a rainstorm set in and continued, at intervals, until the 30th.

27th.—Several marine disasters were reported near New York City during a northwest gale. Drifting snow caused a blockade of street car lines at Buffalo, N. Y.

28th.—Rain began at Port Angeles, Wash., in the afternoon and continued during the 29th, causing streams in Clallam county to overflow their banks.

29th.—The British ship "Ferndale," with 20 of her crew, was reported lost on the Washington coast 9 miles north of the entrance to Grays Harbor.

30th.—A heavy northeast gale prevailed on the southeast New England coast during the 29th and 30th. At Eureka, Cal., high wind and rain prevailed in the early morning. The schooner "Mable Gray" was wrecked north of Cape Mendocino; no lives were lost. A thunderstorm from the southeast began at Tucson, Ariz., 2.02 p. m., and lasted 25 minutes. At 6 p. m. a high wind sprung up from the west and continued one hour, reaching a velocity of 39 miles per hour at 6.10 p. m. The barometer rose .10 inch in 30 minutes. During a thunder and sleet storm at Estalina Springs, N. Mex., some cattle on exposed places on the range were killed.

INLAND NAVIGATION.

ICE IN RIVERS AND HARBORS.

The Hudson River was full of floating ice at Albany, N. Y., on the 9th; near Troy, N. Y., the river was closed by ice. On the 15th the river was clear of ice at Albany, N. Y., and the water was very high.

The Raritan River was closed by ice at New Brunswick, N. J., on the 26th.

Floating ice was reported in the Susquehanna River at Wilkes Barre, Pa., on the 10th, 11th, and 18th; on the 15th the river was clear of ice, and on the 19th it was closed by ice. At Lock Haven, Pa., the Susquehanna River was partly frozen on the 7th, 8th, and 22d to 24th; frozen on the 9th to 12th and 26th to 31st; ice partly gone on the 13th; ice moving out on the 14th and 16th to 18th; and slush ice on the 20th and 21st. On the 28th the Susquehanna was frozen over at Havre de Grace, Md.

The Clarion River was frozen at Clarion, Pa., on the 10th; river clear of ice on the 14th.

Ice was running in the Youghiogheny River at West Newton, Pa., on the 4th, 8th, 9th, and 27th.

Floating ice was reported in the Allegheny River at Freeport, Pa., on the 6th, and from the 9th to 12th the river was frozen.

The Monongahela River was frozen at Greensborough, Pa., on the 10th; river clear of ice on the 13th; navigation closed on the 27th. At Lock No. 4, Pa., ice was floating in the Monongahela River on the 8th, 9th, 11th, 12th, 20th to 22d, 26th, 30th, and 31st; river frozen on the 10th and 27th to 29th; ice running out on the 13th, and the river was clear of ice on the 14th.

Ice broke up in the Little Kanawha River at Glenville, Pa., on the 12th.

Ohio River.—At Pittsburg, Pa., navigation was suspended to points on the Ohio River on the 13th on account of heavy ice; 14th, floating ice in Allegheny River; 21st to 25th, floating ice in both rivers; 26th, floating ice in both rivers, and navigation to points above closed on account of ice and low water; 27th, floating ice in both rivers; 31st, navigation resumed on the Monongahela River, and the river free from ice. At Parkersburgh, W. Va., heavy ice was reported from the 6th to 9th; ice 6 inches in thickness was running on the 10th; 20th to 28th, heavy ice; 29th, but few boats running on account of

heavy ice; ice in river 30th and 31st. At Louisville, Ky., river filled with floating ice on the 12th; navigation partially suspended on the 13th, 14th, and 15th on account of ice; river clear and navigation fully resumed on the 17th. The river was full of floating ice at Vevay, Ind., on the 11th. At Shawneetown, Ill., floating ice was reported from the 8th to 11th; navigation closed on the 12th, and opened on 20th.

Detroit River.—At Detroit, Mich., heavy ice was reported on the 3d; floating ice on the 5th, 6th, 8th, and 9th; 11th, ice backing up from below the city; 13th, large quantities of floating ice; 15th, river frozen over for the first time in several years; a heavy ice bridge formed below the city, delaying the transfer of trains of the Michigan Central, Grand Trunk, and Canadian Pacific Railroads; 18th, ice bridge increasing in size; 20th, river continued frozen and ice jam unbroken; 26th and 27th, heavy running ice; 30th, large quantities of floating ice.

Saint Clair and Black Rivers.—At Port Huron, Mich., the Black River was frozen and the Saint Clair River full of floating ice on the 4th; 7th, floating ice in the Saint Clair River; 8th, Saint Clair River full of floating ice, rendering navigation to Detroit difficult; Lake Huron frozen as far as could be seen; 9th to 11th, floating ice in Saint Clair River; 12th, Saint Clair River full of floating ice, and frozen over from Fort Gratiot to Point Edward; river also reported blocked at Saint Clair, 12 miles below Port Huron; 13th, ice in Sarnia Bay 8 inches in thickness; 26th, Saint Clair River blocked with ice between Port Huron and Sarnia, and ferryboats discontinued their trips; 27th, Saint Clair River frozen over, and for the first time in a number of years persons were crossing on the ice.

At Lansing, Mich., the Grand River was frozen on the 3d, and on the 20th the ice was 9 inches in thickness.

At Sault de Ste. Marie, Mich., the Saint Marys River was frozen over for the first time this season on the 3d, and ferryboats were compelled to discontinue their trips.

Mississippi River.—At Red Wing, Minn., loaded teams were crossing on the ice on the 4th; on the 18th the ice was 24 inches in thickness. At Dubuque, Iowa, the river was frozen over on the 9th; on the 13th the ice was 15 inches, and on the 20th it was 20 inches in thickness. At Davenport Iowa, the river was frozen over on the 7th; 11th, persons crossing on the

ice; 13th, teams crossing on the ice. At Le Claire, Iowa, the river was frozen from the 3d to 31st. At Keokuk, Iowa, the river was frozen on the 9th. At Muscatine, Iowa, the river was frozen on the 7th. At Saint Louis, Mo., the river was frozen on the 16th; ice gorge moved some on the 25th; 29th, ice broken up and river full of floating ice. Teams were reported crossing the river on the ice at Cape Girardeau, Mo., on the 15th, and the 19th an ice gorge formed at that place. At Cairo, Ill., heavy ice commenced running on the 7th, and all boats from Saint Louis bound south were tied up; 8th and 9th, ice running; 12th, river frozen over; 13th to 15th, heavy slush running in the Ohio River; 20th, navigation in the Ohio River difficult on account of floating ice; ice damaged the "Cotton Belt" incline at Birds Point; 22d, ice in the Ohio River ran out; 31st, ice gorge in the Mississippi River broke up and the ice ran out rapidly.

The Missouri River at Saint Pierre, S. Dak., was frozen throughout the month. At Sioux City, Iowa, teams crossed on the ice on the 16th. At Hermann, Mo., floating ice was reported on the 7th; heavy floating ice on the 9th; river gorged with ice on the 11th; ice gorge broken on the 29th.

At Fort Smith, Ark., the Arkansas River was covered for a short time with a thin sheet of ice on the 20th. At Little Rock, Ark., the river was frozen, except in the channel, on the 14th. On the 23d the river was open.

At Manhattan, Kans., the Big Blue River was frozen on the 8th and 12th.

At New Haven, Conn., the harbor was frozen on the 27th. At Erie, Pa., the bay was frozen on the 4th, and on the 7th the ice on the bay was 4 inches in thickness. The river was frozen at Cleveland, Ohio, on the 7th. At Grand Haven, Mich., the harbor was almost blocked by slush ice at the mouth of the river on the 8th; on the 9th steamers forced their way through the slush ice with great difficulty; on the 10th the slush ice was carried into the lake by easterly winds, and navigation was unobstructed; 28th, navigation again obstructed by an accumulation of slush ice. At Milwaukee, Wis., the lake was frozen $\frac{1}{2}$ to $\frac{3}{4}$ mile from shore on the 3d; reports of the 6th and 10th stated that the lake continued frozen.

FLOODS.

In the middle of the month freshets occurred in the streams of New Hampshire, eastern New York, eastern Pennsylvania, and eastern Virginia.

From the 15th to 20th rivers in South Carolina, Georgia, and Alabama rose rapidly. On the 20th the Congaree River was 24.05 feet, 9.05 feet above the danger-line, at Columbia, S. C. At Augusta, Ga., the Savannah River rose to 31 feet by the morning of the 20th, and at 10 p. m., that date, reached 32.8 feet, 0.8 foot above the danger-line, without causing material damage. At Montgomery, Ala., the Alabama River reached 54 feet, 6 feet above the danger-line, on the 16th; no material damage was caused, save to railroads, which were submerged above the city.

The Ohio, Cumberland, and Tennessee rivers rose rapidly the middle part of the month. The rivers rose rapidly at Pittsburg, Pa., and at 6 p. m., 13th, the false work of the Herrs Island bridge was washed away. On the 15th the river reached

22.9 feet at Pittsburg, after which the water subsided. At Cincinnati, Ohio, the river reached 33.5 feet the morning of the 16th, a rise of 13.4 feet in 24 hours. During the next 24 hours it rose to 40.5 feet, and the morning of the 18th stood at 41.6 feet on the gauge, after which it began to fall.

At Chattanooga, Tenn., the Tennessee River was rising at the rate of 4 inches per hour on the 13th. The morning of the 14th the stage of water was 22.9 feet, a rise of 11.7 feet in 24 hours. Heavy drift was observed. The tracks of the Richmond and Danville, and Western and Atlantic Railroads were partially under water. At Charleston, Tenn., the river was 3.5 feet above the danger-line, and at Loudon, Clinton, and Rockwood it was approaching the danger-line. By the morning of the 15th there was a further rise of 10 feet at Chattanooga, and the river rose steadily at the rate of about 0.2 foot per hour. The water at 6 p. m. began to cover the tracks of the Richmond and Danville Railroad at Rossville Avenue; the dummy trains on the Union Belt Line to Look-out Mountain were stopped in the evening, and residents were forced to move from low-lying parts of the city. The morning of the 16th the stage of water was 37.1 feet, a rise of 4.2 feet in 24 hours, and the morning of the 19th it reached 37.9 feet, 4.9 feet above the danger-line, after which the water subsided slowly. The rise at Chattanooga from the 11th to the 17th was 29.8 feet.

Heights of rivers above low-water mark, January, 1892 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River.</i>						
Shreveport, La.	29.9	25, 26	8.5	17	3.5	5.0
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	4	3.9	21, 22, 23	1.8	2.1
Little Rock, Ark.	23.0	4	10.3	18	4.4	5.9
<i>Missouri River.</i>						
Fort Buford, N. Dak. ...	18.7					
Sioux City, Iowa	21.0	31	7.7	10	1.5	6.2
<i>Mississippi River.</i>						
Saint Paul, Minn. ...	14.0					
La Crosse, Wis. ...	11.8					
Dubuque, Iowa ...	16.0					
Davenport, Iowa ...	15.0					
Keokuk, Iowa ...	14.0					
Saint Louis, Mo. ...	30.0	28	10.4	11	2.9	7.5
Cairo, Ill.	40.0	24	30.3	15	14.7	15.6
Memphis, Tenn.	33.0	26, 27	22.0	18	10.4	11.6
Vicksburg, Miss.	41.0	31	28.9	1	16.6	13.3
New Orleans, La.	13.0	31	8.0	1	4.2	3.8
<i>Ohio River.</i>						
Parkersburg, W. Va.	38.0	17	27.0	31	6.6	20.4
Cincinnati, Ohio	45.0	18	41.6	14	14.0	27.6
Louisville, Ky.	24.0	19	16.5	15	7.7	8.8
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	20	30.2	31	9.3	20.9
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	17	37.9	1, 2	6.6	31.3
Knoxville, Tenn.	29.0	15	23.3	1	2.1	21.2
<i>Monongahela River.</i>						
Pittsburg, Pa.	29.0	15	22.9	11	2.5	20.4
<i>Savannah River.</i>						
Augusta, Ga.	32.0	20	32.8	2	7.8	25.0
<i>Willamette River.</i>						
Portland, Oregon	15.0	5	12.1	24, 25	2.3	9.8
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	16	13.2	29	2.1	11.1
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	16	54.0	1	4.6	49.4

* For 27 days.

† River frozen.

‡ For 20 days.

ATMOSPHERIC ELECTRICITY.

AURORAS.

The auroral displays of the month were numerous and brilliant. On the 5th auroras were reported in the northern tier of states from Maine to Washington, and in the western central valleys as far south as the north part of Oklahoma Territory. On the 29th they were observed from Montana to the middle Atlantic and New England states and southward in the central valleys to the 37th parallel, and on the 30th from the Dakotas to the New England coast. Auroras were also reported in northern New England on the 10th; in New York on the 3d,

4th, and 27th; in Michigan on the 27th and 28th; in Wisconsin on the 1st and 28th; in Minnesota on the 23d, 25th, and 28th; in Iowa on the 2d, 3d, 4th, 15th, and 28th; and in the Dakotas on the 12th, 25th, and 28th.

On the 5th the display was one of the most brilliant ever observed at Eastport, Me., and continued from 6.20 p. m. until midnight. It consisted of an arch of 30° to 35° altitude, with great beams of light shooting upward, some of which passed the zenith and almost reached the southern horizon. At Portland, Me., the aurora was observed from 9.15 to 11.45 p. m.

It extended over 270° of azimuth, and at 10.15 p. m. was very brilliant, with streamers reaching to the zenith. At Manchester, N. H., the display continued from 7 to 11 p. m. It consisted of an arch of a bright yellow color, about 10° in width, which extended from northwest over the northern horizon and to altitude 30° . At 8 p. m. streamers and "merry dancers" appeared, some of which shot upward to altitude 60° to 70° . The time of greatest brilliancy was 9.15 to 10 p. m., when the arch had disappeared, and the entire northern half of the sky was filled with beams and streamers of a bright yellow and green, with wavy circles of color in the zenith. After 10 p. m. the display began to fade.

At Northfield, Vt., an auroral arch of a whitish color, extending from east to west and to altitude 45° , was observed from 7.45 to 11 p. m. A brilliant aurora was observed at Boston, Mass., from 8 p. m. until midnight. It first appeared as a band of white light extending over 120° of azimuth and to altitude 40° . At 8.10 p. m. streamers were observed beginning in the northeast and moving westward; they were first visible below the arch, and thence extended upward and through it. From 10 to 11 p. m. brilliant streamers and waves of light flashed from the horizon to the zenith. At Woods Holl., Mass., the display was observed at 6.50 p. m. as a clearly defined white light, extending from east to west, and rising toward the zenith. It increased in brilliancy, with vertical bars of rose color. Later, waves of light moved back and forth and rose nearly to the zenith. The display began to fade 10.40 p. m. At New Haven, Conn., the aurora began 7.45 p. m. as a band of light about 2° in width, extending over 80° of azimuth, and to 30° altitude. At 8.20 p. m. streamers extended from the arch 20° to 30° towards the zenith. The time of greatest brilliancy was about 8.30 p. m.

At Oswego, N. Y., an arch of dim light reaching 30° altitude was observed at 6.40 p. m. At 6.55 p. m. the light was a yellowish white, with a rosy tint in the northwest. At 8.30 p. m. the arch extended to within about 5° of the zenith, with waves or flashes of light on the east and west sides and below the arch. The display was last observed 12.45 a. m., 6th, as a dim arch of 15° to 20° altitude resting on a very dark segment. At South Canisteo, N. Y., a light aurora extended from northwest to northeast and to altitude 35° at 8 p. m. It began to fade at 8.50 and disappeared at 9 p. m. At Red Wing, Minn., an aurora was observed from 10 p. m. until midnight; it was brightest at 11.40 p. m., when "merry dancers" extended from 150° to 200° azimuth, and rose to altitude about 25° .

At Bismarck, N. Dak., an aurora, consisting of bright, irregular beams, extending to altitude 40° to 50° , was observed from 7.30 to 9.50 p. m. At Fort Buford, N. Dak., a brilliant aurora consisting of 2 streamers of a bluish color in the northwest, extending about 30° above the horizon, was observed at 8.15 p. m. At 8.45 p. m. a band extended from northwest to east with many streamers, two of which were in the northeast and nearly reached the zenith. At this time the color changed gradually to a rosy hue, which was more pronounced 60° above the horizon. At 11 p. m. the display began to fade, and at 11.30 p. m. it had disappeared. At Miles City, Mont., a pale but plainly visible aurora consisting of a diffused light without motion, but with pale columns moving from the horizon

to an arch of altitude about 30° , was observed from 8 to 11.45 p. m.

At Fort Assinaboine, Mont., an aurora consisting of luminous beams of a pale yellow and reddish color rising to the zenith appeared 9 p. m. At 9.30 p. m. the display consisted of 3 arches, the upper one of which extended across the sky from west to east, and at 9.40 p. m. the arches assumed a serpentine shape, with beams of light. At 10.10 p. m., the arches were about 40° altitude and appeared as a brilliant curtain with a variety of colors. The display disappeared 10.30 p. m. At Olympia, Wash., an aurora consisting of 2 streamers of a rosy color reaching altitude 20° to 40° , and shorter streamers on either side, was observed 9.10 p. m. The display was last seen 11.15 p. m.

On the 28th an aurora was observed at Detroit, Mich., in the early morning. It was first seen at 5.20 a. m., when it extended from northwest to northeast and to altitude about 80° . It was a deep crimson color near the base, and rested on a bank of dark clouds; broad shafts of light rose to the zenith; the red color at the base faded into yellow and finally assumed a greenish tinge as the display waned; and at 7.30 a. m. (75th meridian time) the aurora disappeared.

On the 29th, at 3.40 a. m., a brilliant aurora was observed in the northern sky at Red Wing, Minn. "Merry dancers" appeared and finally formed into 4 distinct columns, which rose gradually to the zenith at 5.20 a. m. The display disappeared 5.45 a. m. On this date a brilliant aurora, extending from 100° to 250° of azimuth, was observed from 2 to 7 a. m. at Huron, S. Dak. It consisted of waving beams, some of which reached the zenith; at times the beams would disappear for several seconds; and at such times a bright purple arch was visible in the north. On the same date a brilliant aurora, extending from 175° to 225° of azimuth, was observed at Topeka, Kans., at 6.30 a. m. Streamers of great brilliancy extended to altitude 20° to 35° . The aurora had an apparent motion from west to east, and faded with the advancing daylight.

THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 11, on the 1st; in 7 on the 2d and 5th; in 6 on the 4th and 12th; in 5 on the 11th and 13th; in 3 on the 18th; in 2 on the 9th, 10th, 14th, 19th, 25th, and 30th; and in 1 on the 3d, 7th, 8th, and 31st. No thunderstorms were reported on the 4th, 15th to 17th, 20th to 24th, and 26th to 29th.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 10, in Louisiana; on 7 in Mississippi; on 6 in Alabama and Florida; on 5 in Georgia and Texas; on 3 in North Carolina and Tennessee; on 2 in Kansas, Massachusetts, Missouri, New York, Ohio, Pennsylvania, and South Carolina; and on 1 in Arkansas, Connecticut, Iowa, Maryland, Nebraska, New Jersey, and Wisconsin.

West of the Rocky Mountains thunderstorms were reported in Arizona on the 21st, and 28th to 30th; in Colorado on the 30th; and in New Mexico on the 28th, 30th, and 31st. In states and territories other than those named no thunderstorms were reported.

MISCELLANEOUS PHENOMENA.

MINERAL MATTER DEPOSITED WITH SNOW IN NORTHERN INDIANA, JANUARY 8, 1892.

Mr. Arthur Goss, of the Chemical Department of Purdue University, La Fayette, Ind., furnishes the following as the result of a chemical analysis of a sample of dark-colored mineral matter in the form of fine powder received at the University from Mr. N. W. Garman, of Rolling Prairie, Ind., who

stated that it fell with the snow of January 8th over an extended area in northern Indiana:

"Loss on ignition (water and other volatile matter)....	15.04
Silica (SiO_2).....	65.64
Aluminium (Al_2O_3) }	
Iron (Fe_2O_3)..... }	15.50
Lime (CaO)	2.19

Magnesia (MgO).....	1.38
Phosphoric acid (P ₂ O ₅).....	.10
TiO ₂ and loss (by difference).....	.15
Total.....	100.00

"The entire absence of potash and the presence of a small

amount of titanium prove conclusively that it is not dust of a local origin; the absence of metallic iron ore and nickel shows that it is not of meteoric origin; and the low percentage of lime would indicate that it is not slag from an iron furnace. As it approximates very closely to some of the recorded analyses of lava (especially lava from the Pacific Ocean islands and Iceland) it is in all probability of volcanic origin."

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for January, 1892, of the directors of the various state weather services:

ALABAMA.

Temperature.—The mean was 1.8 below the normal; maximum, 77, at Curtis, 5th; minimum, 10, at Mountain Home, 6th, and at Valley Head, 7th; greatest monthly range, 58, at Florence; least monthly range, 39, at Chepultepec.

Precipitation.—The average was 2.15 above the normal; greatest monthly, 12.55, at Mount Willing; least monthly, 2.70, at Tuscumbia.

Wind.—Prevailing direction, northwest.—*P. H. Mell, Observer, Weather Bureau, Auburn, director.*

ARIZONA.

Temperature.—The mean was about normal in the central and eastern parts of the territory, while in the western part it ranged about 3.0 above; maximum, 80, at Red Rock, 25th; minimum, —11, at Flagstaff, 13th; greatest monthly range, 73, at Flagstaff; least monthly range, 38, at Gila Bend.

Precipitation.—The precipitation was unusually heavy, averaging about 1.00 above the normal; greatest monthly, 7.00, at Flagstaff; least monthly, 0.30, at Teviston.

Wind.—Prevailing direction, southwest.—*J. C. Hayden, Observer, Weather Bureau, Tucson, director.*

ARKANSAS.

Temperature.—The mean was 1.1 below the normal; maximum, 74, at Hot Springs, 29th; minimum, —14, at Rogers, 19th; greatest monthly range, 80, at Rogers; least monthly range, 43, at Newport.

Precipitation.—The average was 1.62 below the normal; greatest monthly, 5.59, at Greenville, Miss.; least monthly, 0.55, at Paragould.

Wind.—Prevailing direction, north.—*M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Observer, Weather Bureau, assistant.*

COLORADO.

Temperature.—The mean was slightly above the normal; maximum, 71, at Lamar, 30th; minimum, —36, at Platoro, 13th; greatest monthly range, 94, at Julesburg; least monthly range, 54, at T. S. Ranch.

Precipitation.—The average was slightly above the normal, except in the central part; greatest monthly, 3.40, at Cumbres; least monthly, 0.00, at Sanborn and East Dale.—*W. S. Miller, Observer, Weather Bureau, Denver, director.*

FLORIDA.

Temperature.—Maximum, 83, at Manatee, 11th; minimum, 22, at Archer and Fort Meade, 4th; greatest monthly range, 60, at Archer; least monthly range, 26, at Key West.

Precipitation.—Greatest monthly, 6.72, at Pensacola; least monthly, 0.29, at Hypoluxo.

Wind.—Prevailing direction, northwest.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

GEORGIA.

Temperature.—Maximum, 76, at Quitman, 12th; minimum, 9, at Diamond, 7th; greatest monthly range, 55, at Millen; least monthly range, 32, at Elberton.

Precipitation.—Greatest monthly, 12.59, at Canton; least monthly, 2.49, at Savannah.

Wind.—Prevailing direction, northwest.—*Park Morrill, Local Forecast Official, Weather Bureau, Atlanta, director.*

ILLINOIS.

Temperature.—The mean was 3.7 below the normal of the last 17 years; maximum, 62, at Cairo and Golconda, 1st; minimum, —25, at Philo, 15th and 20th.

Precipitation.—The mean was 0.70 below the normal of the last 14 years; greatest monthly, 2.70, at Mascoutah; least monthly, 0.30, at New Haven.

Wind.—Prevailing direction, northwest.—*John Craig, Observer, Weather Bureau, Springfield, director.*

INDIANA.

Temperature.—The mean was 2.7 below the normal; maximum, 62, at

Marengo, 29th; minimum, —22, at Marion, 20th; greatest monthly range, 78, at Marion; least monthly range, 55, at Michigan City.

Precipitation.—The average was 1.54 below the normal; greatest monthly, 2.43, at Vevay; least monthly, 0.69, at Shelbyville.

Wind.—Prevailing direction, southwest.—*Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

IOWA WEATHER AND CROP SERVICE.

Temperature.—Maximum, 76, at Glenwood, 29th; minimum, —38, at Atlantic, 19th; greatest monthly range, 108, at Glenwood; least monthly range, 58, at Davenport.

Precipitation.—Greatest monthly, 3.13, at Fairfield; least monthly, 0.10, at Bancroft.

Wind.—Prevailing direction, northwest.—*J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.*

KANSAS.

Temperature.—The mean was 1.1 above the normal; maximum, 81, at Shields, 26th; minimum, —34, at Seneca, 19th; greatest monthly range, 92, at Seneca; least monthly range, 69, at Altoona.

Precipitation.—The average was 0.27 below the normal; greatest monthly, 3.05, at Morse; least monthly, 0.02, at Shields.

Wind.—Prevailing direction, north.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Observer, Weather Bureau, assistant.*

KENTUCKY.

Temperature.—The mean was about 3.0 below the normal; maximum, 65, at Earlington, 29th; minimum, —6, at Pellville, 15th; greatest monthly range, 68, at Earlington; least monthly range, 46, at Richmond.

Precipitation.—The average was about 1.50 below the normal; greatest monthly, 6.46, at Middlesborough; least monthly, 0.92, at Earlington.

Wind.—Prevailing direction, southwest.—*Frank Burke, Observer, Weather Bureau, Louisville, director.*

LOUISIANA.

Temperature.—The mean was 4.8 below the normal; maximum, 79, at Abbeville, 29th, and at Cameron, 30th; minimum, 9, at Winnsborough, 19th and 20th; greatest monthly range, 66, at Winnsborough; least monthly range, 44, at Port Eads.

Precipitation.—The average was 0.43 above the normal; greatest monthly, 10.20, at Abbeville; least monthly, 0.51, at Delhi.

Wind.—Prevailing direction, north.—*George E. Hunt, Local Forecast Official, Weather Bureau, New Orleans, director.*

MARYLAND.

Temperature.—Maximum, 70, at Kirkwood, Del., 14th; minimum, 0, at Boettcherville; greatest monthly range, 63, at Charlotte Hall; least monthly range, 42, at New Market.

Precipitation.—Greatest monthly, 6.54, at Fallston; least monthly, 1.87, at Taneytown.

Wind.—Prevailing direction, northwest.—*Dr. William B. Clark, Johns Hopkins University, Baltimore, director; Prof. Milton Whitney, Maryland Agricultural College, secretary and treasurer; C. P. Cronk, Observer, Weather Bureau, in charge.*

MICHIGAN.

Temperature.—The mean was 4.0 below the normal of the last 16 years; maximum, 57, at Birch Run, 1st; minimum, —26, at Adrian, 20th; greatest monthly range, 80, at Adrian; least monthly range, 40, at Charlevoix.

Precipitation.—The average was 0.12 below the normal of the last 16 years; greatest monthly, 7.10, at Atlantic; least monthly, 0.44, at Hillsdale.

Wind.—Prevailing direction, southwest.—*E. A. Evans, Local Forecast Official, Weather Bureau, Detroit, director.*

MINNESOTA.

Temperature.—The mean was slightly above the normal, except in the north-eastern part; maximum, 54, at Mankato, 29th; minimum, —44, at Crookston, 18th; greatest monthly range, 87, at Leech Lake and Winibigoshish; least monthly range, 69, at Saint Paul and Sheldon.

Precipitation.—The average was considerably below the normal; greatest monthly, 0.82, at Kinbrae; least monthly, 0.02, at Saint Paul.

Wind.—Prevailing direction, northwest.—*J. H. Harmon, Observer, Weather Bureau, Minneapolis, director.*

MONTANA.

Temperature.—The mean was considerably above the normal; maximum, 61, at Choteau, 25th; minimum, —46, at Powder River, 18th.

Precipitation.—The average was 0.52 below the normal; greatest monthly, 2.26, at Choteau; least monthly, trace, at Dearborn Canyon.—*E. J. Glass, Observer, Weather Bureau, Helena, director.*

MISSISSIPPI.

Temperature.—The mean was 1.1 below the normal; maximum, 76, at Louisville, 4th; minimum, 7, at University, 7th; greatest monthly range, 67, at Louisville; least monthly range, 44, at Ship Island.

Precipitation.—The average was 0.73 above the normal; greatest monthly, 3.60, at Natchez.

Wind.—Prevailing direction, north.—*R. B. Fulton, Observer, Weather Bureau, University, director.*

MISSOURI.

Temperature.—The mean was 1.9 below the normal; maximum, 67, at Mine La Motte, 25th; minimum, —31, at Pickering, 19th; greatest monthly range, 85, at Mine La Motte; least monthly range, 55, at Hermann.

Precipitation.—The average was 0.04 below the normal; greatest monthly, 3.79, at Hermann; least monthly, 0.55, at Mine La Motte.

Wind.—Prevailing direction, northwest.—*Levi Chubbuck, Secretary of State Board of Agriculture, Columbia, director; J. H. Smith, Observer, Weather Bureau, assistant.*

NEBRASKA.

Temperature.—Maximum, 72, at Belvidere, 29th; minimum, —42, at Ansley, 19th; greatest monthly range, 106, at Ansley; least monthly range, 69, at Burwell.

Precipitation.—Greatest monthly, 2.16, at Pawlet; least monthly, 0.07, at York.

Wind.—Prevailing direction, northwest.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Observer, Weather Bureau, assistant.*

NEVADA.

Temperature.—The mean was about 2.0 above the normal; maximum, 73, at Tuscarora, 24th; minimum, —25, at Stofiel, 26th, and at Pioche, 6th.

Precipitation.—The average was 0.95 below the normal; greatest monthly, 2.77, at Tuscarora; least monthly, 0.02, at Humboldt and Wabuska.

Wind.—Prevailing direction, south.—*Prof. Charles W. Friend, Carson City, director; F. A. Carpenter, Observer, Weather Bureau, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

Temperature.—The mean was 2.0 above the normal; maximum, 64, at Plymouth (Mass.), 14th; minimum, —30, at Enosburgh Falls, 20th; greatest monthly range, 86, at West Milan; least monthly range, 48, at Portland.

Precipitation.—The average was 0.84 above the normal; greatest monthly, 7.01, at Lake Konomac; least monthly, 2.23, at Nantucket.

Wind.—Prevailing direction, northwest.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; J. Warren Smith, Observer, Weather Bureau, assistant.*

NEW JERSEY.

Temperature.—The mean was 0.3 above the normal; maximum, 64, at Mount Holly and Tenafly, 14th; minimum, —6, at Hanover, 17th; greatest monthly range, 65, at Dover and Hanover; least monthly range, 48, at Atlantic City.

Precipitation.—The average was 1.51 above the normal; greatest monthly, 7.05, at South Orange; least monthly, 2.50, at Newton.

Wind.—Prevailing direction, northwest.—*E. W. McGann, Observer, Weather Bureau, New Brunswick, director.*

NEW MEXICO.

Temperature.—Maximum, 76, at La Luz, 30th; minimum, —32, at Dulce, 12th; greatest monthly range, 91, at Halls Peak; least monthly range, 39, at Springer.

Precipitation.—Greatest monthly, 1.84, at Chama; least monthly, 0.30, at Springer.

Wind.—Prevailing direction, northwest.—*H. B. Hersey, Observer, Weather Bureau, Santa Fe, director.*

NEW YORK.

Temperature.—The mean was 1.2 below the normal; maximum, 67, at Poughkeepsie, 14th; minimum, —31, at Madison Barracks, 20th; greatest monthly range, 81, at Madison Barracks; least monthly range, 40, at Fort Columbus.

Precipitation.—The average was 1.03 above the normal; greatest monthly, 7.96, at Fort Schuyler; least monthly, 2.10, at Oswego.

Wind.—Prevailing direction, southwest.—*Prof. E. A. Fuertes, Dean of the College of Civil Engineering, Cornell University, Ithaca, director; R. M. Hardinge, Observer, Weather Bureau, assistant.*

NORTH CAROLINA.

There was more than the usual number of severe cold waves.

Temperature.—The mean was 3.4 below the normal; maximum, 72, at Nor-

folk, Va., 13th; minimum, 4, at Linville, 8th; greatest monthly range, 57, at Knoxville, Tenn.; least monthly range, 42, at Southport.

Precipitation.—The average was 1.32 above the normal; greatest monthly, 11.50, at Concord; least monthly, 1.89, at Linville.

Wind.—Prevailing direction, northwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Observer, Weather Bureau, assistant.*

NORTH DAKOTA.

Temperature.—The mean was 4.2 above the normal; maximum, 58, at Grafton, 29th; minimum, —52, at Willow City, 19th; greatest monthly range, 96, at Grafton, least monthly range, 74, at Napoleon.

Wind.—Prevailing direction, northwest.—*W. H. Fallon, Observer, Weather Bureau, Bismarck, director.*

OHIO.

Temperature.—The mean was 3.0 below the normal; maximum, 61, at Marietta, 1st; minimum, —25, at Wapakoneta and Montpelier, 20th; greatest monthly range, 79, at Weymouth and Garrettsville; least monthly range, 51, at Portsmouth.

Precipitation.—The average was 1.08 below the normal; greatest monthly, 5.07, at Ashland; least monthly, 0.85, at Jacksonborough.

Wind.—Prevailing direction, southwest.—*Prof. B. F. Thomas, Columbus, director; C. M. Strong, Observer, Weather Bureau, secretary and assistant.*

OKLAHOMA.

Temperature.—Maximum, 75, at Fort Supply, 28th, at Gate City, 29th, and at Purcell, 25th; minimum, —14, at Gate City, 19th; greatest monthly range, 89, at Gate City; least monthly range, 74, at Burnet.

Precipitation.—Greatest monthly, 0.93, at Oklahoma City; least monthly, trace, at Fort Supply.—*Louis Dorman, Observer, Weather Bureau, Oklahoma City, director.*

OREGON.

Temperature.—The mean was 2.4 above the normal; maximum, 63, at Bandon, 22d, at Toledo, 23d, and at Roseburg, 25th; minimum, —11, at Beulah, 12th; greatest monthly range, 69, at Pendleton; least monthly range, 19, at Newport.

Precipitation.—The average was 2.84 below the normal; greatest monthly, 9.96, at Langlois; least monthly, 0.12, at Silver Lake.

Wind.—Prevailing direction, southwest.—*Hon. H. E. Hayes, Master State Grange, Portland, director; B. S. Pague, Observer, Weather Bureau, asst.*

PENNSYLVANIA.

Temperature.—The mean was about 0.5 below the normal; maximum, 66, at Drifton, 14th; minimum, —28, at Columbus, 10th; greatest monthly range, 77, at Saegerstown; least monthly range, 45, at Harrisburg.

Precipitation.—The average was 1.17 above the normal; greatest monthly, 8.46, at Girardville; least monthly, 2.08, at Altoona.

Wind.—Prevailing direction, northwest.—*Under direction of the Franklin Institute, Philadelphia; H. L. Ball, Observer, Weather Bureau, assistant.*

SOUTH CAROLINA.

Temperature.—Maximum, 72, at Conway and Trial, 19th; minimum, 16, at Trial, 28th.

Precipitation.—Greatest monthly, 9.82, at Evergreen; least monthly, 2.94, at Port Royal.

Wind.—Prevailing direction, northwest.—*A. P. Butler, Observer, Weather Bureau, Columbia, director.*

SOUTH DAKOTA.

Temperature.—The mean was 0.3 above the normal; maximum, 69, at Rapid City, 30th; minimum, —40, at Sioux Falls, 19th; greatest monthly range, 94, at Rapid City; least monthly range, 74, at Aberdeen.

Precipitation.—The average was 0.09 below the normal; greatest monthly, 2.55, at Oelrichs; least monthly, 0.07, at Millbank.

Wind.—Prevailing direction, northwest.—*S. W. Glenn, Local Forecast Official, Weather Bureau, Huron, director.*

TENNESSEE WEATHER CROP SERVICE.

The month was the coldest since 1888.

Temperature.—The mean was 4.0 below the normal; maximum, 66, at Knoxville, 1st, at Lynnville, 2d, and at Chattanooga and Memphis, 25th; minimum, 4, at Northville, 4th; greatest monthly range, 60, at Bethel Springs; least monthly range, 36, at Andersonville.

Precipitation.—The average was 0.86 below the normal; greatest monthly, 8.72, at Parkville; least monthly, 0.98, at Waynesborough.—*J. B. Marbury, Local Forecast Official, Weather Bureau, Nashville, director.*

TEXAS.

Temperature.—The mean was below the normal; maximum, 89, at Nacogdoches, 31st; minimum, —10, at Silver Falls, 19th; greatest monthly range, 94, at Childress; least monthly range, 46, at Galveston.

Precipitation.—The average was 1.08 below the normal; greatest monthly, 3.93, at Palestine; least monthly, 0.10, at Roby.—*D. D. Bryan, Galveston, director; I. M. Cline, Local Forecast Official, Weather Bureau, assistant.*

UTAH.

Temperature.—Maximum, 68, at Saint George, 27th; minimum, —17, at Nephi, 11th; greatest monthly range, 64, at Cisco; least monthly range, 31, at Grouse Creek.

Precipitation.—Greatest monthly, 1.70, at Lake Park; least monthly, 0.13, at Thistle.—G. N. Salisbury, Observer, Weather Bureau, Salt Lake City, director.

VIRGINIA.

Temperature.—Maximum, 74, at Richmond, 14th; minimum, —2, at Lexington, 8th; greatest monthly range, 65, at Richmond; least monthly range, 48, at Bedford City and Blacksburg.

Precipitation.—Greatest monthly, 5.95, at Avon; least monthly, 2.99, at Blacksburg.

Wind.—Prevailing direction, northwest.—Dr. E. A. Craighill, Lynchburg, director; J. N. Ryker, Observer, Weather Bureau, assistant.

WASHINGTON.

Temperature.—The mean was 1.9 above the normal; maximum, 69, at Centerville, 1st; minimum, —9, at Waterville, 11th and 12th; greatest monthly range, 62, at Walla Walla; least monthly range, 23, at Aberdeen.

Precipitation.—The average was 1.82 below the normal; greatest monthly, 13.51, at Neah Bay; least monthly, 0.50, at Waterville.—E. B. Olney, Observer, Weather Bureau, Olympia, director.

WEST VIRGINIA.

Temperature.—Maximum, 76, at Morgantown, 1st; minimum, —3, at Tan-

nery, 10th; greatest monthly range, 74, at Morgantown; least monthly range, 43, at Piedmont.

Precipitation.—Greatest monthly, 4.91, at Parkersburgh; least monthly, 1.67, at Romney.

Wind.—Prevailing direction, west.—W. W. Dent, Observer, Weather Bureau, Parkersburgh, director.

WISCONSIN.

Temperature.—Maximum, 58, at Prairie du Chien, 25th; minimum, —45, at Haywards, 19th; greatest monthly range, 84, at Barron and Butternut; least monthly range, 51, at Beaver Dam.

Precipitation.—Greatest monthly, 3.88, at New Holstein; least monthly, 0.07, at Osceola Mills.

Wind.—Prevailing direction, northwest.—W. L. Moore, Local Forecast Official, Weather Bureau, Milwaukee, director.

WYOMING.

Temperature.—The mean was slightly below the normal; maximum, 72, at Casper, 24th; minimum, —44, at Fort Fetterman, 11th; greatest monthly range, 112, at Fort Fetterman; least monthly range, 70, at Evanston.

Precipitation.—The average was slightly above the normal; greatest monthly, 1.21, at Lusk; least monthly, 0.00, at Bitter Creek.

Wind.—Prevailing direction, west.—E. M. Ravenscraft, Observer, Weather Bureau, Cheyenne, director.

CONTRIBUTIONS AND ORIGINAL ARTICLES.

CHINOOK WINDS.

[By E. B. GARRIOTT, Weather Bureau.]

Winds of a peculiar type, characterized by unusual warmth and dryness, occur during the colder months in various parts of the globe. The *Chinooks* of the northwestern part of the United States, the *Föhn* of Switzerland, and the *Zonda* of the Argentine Republic belong to this type.

The *Chinooks* are warm, dry winds, often of considerable force, which sweep over districts east of the principal mountain ranges of the northwestern part of the United States. Their occurrence is confined to the colder months. They are felt as far south as the middle-eastern slope of the Rocky Mountains; but are more pronounced on the northeast slope, which embraces Montana and the southern Saskatchewan valley.

The *Chinooks* are storm winds, and belong to the wind system of regular cyclonic areas. From October to March, inclusive, a principal track of low pressure areas or general storms lies north of Washington, Idaho, and Montana. The passage of these storms is attended in districts to the southward by westerly winds whose strength is proportional to the energy of the cyclonic disturbance, whose force diminishes as the distance from the center of disturbance increases, and whose duration depends upon the velocity of the storm-center.

The winter temperatures in Montana are among the lowest noted in the United States. With the approach of a low pressure storm from the north Pacific coast, and preceding the appearance or development of such a storm in extreme western British America, high pressure and low temperature obtain over the northeast slope of the Rocky Mountains, and a high pressure area usually occupies the middle plateau region. As the low area approaches or extends its influence rain will set in on the north Pacific coast; the temperature will be 40° to 50° in that district; and a temperature gradient or difference of 40°, or more, will be shown between the regions to the east and west of the Rocky Mountains. In low areas of pronounced strength the cyclonic indraught causes westerly winds from the mountains over Montana and southern Alberta; the cold air to the leeward of the mountains is withdrawn by the general movement of the lower atmosphere, and is replaced by air from the windward side. Following the march of the mass of warm, moist air from west of the Rocky Mountains we find that it reaches the windward side with temperature 40°, or more, higher than the temperature of the air to the leeward. Forced to the summit it loses heat by expansion and moisture by condensation of aqueous vapor by the cold of elevation, the latter operation being attended by the liberation of more or less latent heat, which has the effect of modifying to some extent the chilling process. In descending the leeward side to replace the air removed by the westerly winds it acquires heat by compression. If the loss of heat by expansion in the ascent is compensated by the gain by compression in the descent, the air forced over the mountains assumes practically the same temperature it had before the ascent was commenced, and is 40°, or more, warmer than the air it replaced.

These warm, and in the case above mentioned dried, winds sweep eastward with the advance of the storm-center. Their eastward limit depends upon the movement and character of the general storm, and also upon the condition of the ground over which they pass as regards dryness and moisture. If the

ground is covered with snow much heat is lost in the process of evaporation. The snow is melted by the warmth, and the liberated moisture is absorbed by the dry air. In such cases the air is gradually chilled, and the temperature rise is less marked as the distance traveled by the crest of the warm wave increases.

A remarkable feature of the *Chinooks* is the marked temperature rise which attends their arrival. Thermograph record sheets show an almost vertical line of ascent covering 40° to 50°, and reports indicate that an increase of 70° to 80° in six to eight hours is not uncommon.

The *Chinooks* occur under well-defined meteorological conditions, and a forecast of their approach is not more difficult than a prediction of warmer weather for the eastern part of the country.

When conditions are favorable the warm winds of the Northwest are supplemented by warm air drawn by the cyclonic indraught from southern latitudes of the central valleys. The *Chinook* contingent is re-enforced, and the warm condition or warm wave accompanies the low pressure area in its advance to the Atlantic coast.

Warm, dry winds are not uncommon on the middle-eastern slope of the Rocky Mountains. The cyclonic system of winds is also the cause of their origin in that region. The temperature conditions preceding their occurrence are somewhat similar to those observed in connection with the *Chinooks* of the Northwest. A body of cold air occupies the districts on the leeward side of the mountains, and the air to the windward shows comparatively higher temperature. The air from the elevated plateau is forced over the mountains and gains heat by compression during the descent on the leeward side.

In the warmer months conditions for the development of the *Chinooks*, as warm winds, rarely exist. Cyclonic areas seldom pass from the north Pacific Ocean over the Saskatchewan Valley during that season. In summer the northeast slope of the Rocky Mountains is one of the warmest and the north Pacific coast is one of the coolest districts in the United States. With the passage of a storm-center north of the *Chinook* region the wind would blow, not from a warm to a cold region, but from a cool to a much warmer region. To the leeward of the mountains it would be a cooler rather than a warmer wind.

Following a period of intense cold the *Chinook* wind is a welcome visitor in the Northwest. The icy clutch of winter is loosened. The earth throws off its winding-sheet of snow. Humanity ventures forth to inhale the balmy, spring-like air. Animate nature rejoices.

A notable *Chinook* wind was experienced in the Northwest January 19, 1892. A graphic illustration of the temperature change due to this wind is shown by a copy of a section of the thermograph record sheet at Fort Assinaboine, Mont., which appears in a description of low area VIII in this REVIEW. This record shows a temperature rise of about 43° in fifteen minutes, and a rise of about 49° in less than three hours. Chart VII with this number of the REVIEW shows the general meteorological conditions west of the 95th meridian at the 8 p. m. report of January 18th, which preceded, and at the 8 a. m. report of January 19th, which followed, the arrival of the *Chinook* at Fort Assinaboine. Under low area VIII a description of these charts is included in a general description of the meteorological conditions which obtained in the Northwest during January 18 and 19, 1892.

METEOROLOGICAL TABLES.

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, January, 1892.

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.					
	Max.	Min.	Mean.			Max.	Min.	Mean.			Max.	Min.	Mean.						
Alabama.					Arizona—Cont'd.					California—Cont'd.					California—Cont'd.				
Bermuda [†]	67	20	42.8	Ins.	Woodruff [†]	86	37	57.6	1.00	Evergreen [†]	83	34	51.6	0.98	Pt. Conception L. H.	.....	.....	.....	0.75
Bessemer [†]	60	16	37.0	6.44	Yuma [†]	86	37	57.6	0.19	Farmington [†]	80	34	51.6	0.97	Point Fermin L. H.	.....	.....	.....	0.41
Brewton [†]	76	20	43.7	12.45	Arkansas.					Felton [†]	75	32	39.6	0.57	Pt. Hueneme L. H.	.....	.....	.....	0.48
Carrollton [†]	65	18	39.0	7.55	Arkadelphia [†]				2.53	Fernando [†]	77	37	50.3	0.93	Point Montara L. H.	.....	.....	.....	1.16
Chepultepec [†]	54	16	34.6	.....	Black Rock [†]	64	—	30.9	1.66	Florence [†]	64	32	44.3	.....	Point Pinos L. H.	.....	.....	.....	0.96
Childersburgh [†]	68	24	46.8	6.33	Brinkley [†]	68	8	36.2	2.50	Florin [†]	65	35	50.4	2.83	Point Reyes L. H.	.....	.....	.....	4.68
Citronelle [†]	77	21	48.7	7.49	Camden [†]	73	13	37.9	5.09	Folsom City [†]	73	17	43.0	2.56	Point Sur L. H.	.....	.....	.....	0.84
Claiborne Landing [†]	75	22	49.0	7.09	Conway [†]	60	0	32.9	1.83	Folsom City [†]	62	30	47.9	0.79	Porterville [†]	96	31	53.0	0.95
Cordova [†]	66 ^h	23 ^h	40.2 ^h	4.16 ^h	Corner Stone [†]	66 ^h	9 ^h	33.0 ^h	2.06 ^h	Forestville [†]	60	27	42.0	3.93	Presidio [†]	70	34	50.6	0.26
Curtis [†]	70	12	36.9	3.61	Dallas [†]	69	3	34.5	2.64	Fort Bidwell [†]	62	38	50.6	1.37	Puente [†]	78	36	55.0	0.61
Daphne [†]	77	21	48.7	6.64	Dardanelle [†]	65	—12	30.8	2.75	Fort Mason [†]	64	36	50.7	10.86	Ravenna [†]	68	31	50.9	1.32
Decatur [†]	75	22	49.0	7.09	Fayetteville [†]	70	10	39.1	2.66	Fort Ross [†]	64	35	50.7	0.37	Red Bluff [†]	69	34	46.6	2.73
Eufaula [†]	66 ^h	23 ^h	40.2 ^h	4.16 ^h	Forrest City [†]	65	—12	30.8	2.75	Fresno [†]	65	35	47.9	2.00	Redding [†]	68	30	44.1	1.19
Florence [†]	70	12	36.9	3.61	Fulton [†]	70	10	39.1	2.66	Galt [†]	65	34	47.9	0.71	Redlands [†]	67	30	46.1	4.08
Gadsden [†]	74	25	47.6	7.43	Gaines Landing [†]	70	—1	32.6	1.85	Georgetown [†]	66	30	49.2	5.48	Riverside [†]	80	31	54.6	0.53
Geneva [†]	70	20	42.1	7.56	Harrisburgh [†]	70	—1	32.6	1.85	Gilroy [†]	66	30	49.2	.....	Roe Island L. H.	.....	.....	.....	1.45
Greensborough [†]	76	19	45.4	8.84	Harrison [†]	64 ^h	—10 ^h	31.5 ^h	2.40 ^h	Glen Ellen [†]	62	30	44.8	1.06	Rocklin [†]	60	32	46.6	2.49
Healing Springs [†]	63	14	36.3	7.43	Helena [†]	66	2	36.4	2.93	Goshen [†]	67	30	47.9	9.26	Rumsey [†]	68	32	49.6	3.49
Jasper [†]	68	21	43.0	8.60	Helena [†]	66	2	36.4	2.93	Grass Valley [†]	62	30	45.3	.....	Sacramento [†]	58	27	41.8	1.78
Jemison [†]	70	19	39.3	7.34	Hot Springs [†]	71	8	37.1	3.98	Grass Valley [†]	58	25	41.2	4.70	Sacramento [†]	71	32	48.8	1.32
Livingston [†]	67	17	39.3	5.85	Lonoke [†]	74	4	35.9	3.06	Haywards [†]	60	33	47.0	4.37	Sacramento [†]	59	40	47.2	1.37
Mayaville [†]	64	10	33.2	5.71	Madding [†]	64	9	37.9	3.13	Hollister [†]	71	32	51.1	0.13	Saint Helena [†]	72 ^a	36 ^a	53.1	5.83
Mountain Home [†]	64	23	42.9	12.55	Malvern [†]	64	10	34.5	3.93	Hornbrook [†]	54	22	37.0	0.70	Salinas [†]	66	33 ^h	49.0 ^h	0.44
Mt. Vernon B'ks. [†]	72	22	45.7	8.62	Marshall [†]	64	—3	32.9	2.50	Humboldt L. H. [†]	64	32	46.3	3.74	Salton [†]	62	32	47.5	0.48
Newburgh [†]	67	13	38.2	4.78	Mount Nebo [†]	64	1	33.0	1.40	Huron [†]	64	32	46.3	0.21	Sanger Junction [†]	92	28	53.2	2.75
Newton [†]	76	23	42.0	7.13	Newport [†]	60	17	33.9	1.55	Hyde Ranch [†]	65	32	48.3	1.15	San Ardo [†]	67	33	50.8	0.74
Oxanna [†]	66	21	40.5	1.01	Newport [†]	66	4	33.2	1.43	Indio [†]	76	32	56.2	2.00	San Ardo [†]	70	30	48.7	0.58
Pittsborough [†]	70	19	43.5	7.94	Ocala [†]	66	—3	32.9	2.50	Ione [†]	62	29	45.6	2.00	San Bernardino [†]	74	30	52.9	3.34
Pushmataha [†]	64	15	35.4	10.25	Ozark [†]	68	—6	31.6	1.10	Iowa Hill [†]	67	34	47.8	4.01	San Diego B'ks. [†]	73	33	53.8	1.55
Selma [†]	64	15	35.4	9.89	Paragould [†]	68	—6	31.6	1.10	Jackson [†]	73	20	45.3	3.21	San Gabriel [†]	73	33	51.8	1.19
Scottsboro [†]	68	17	38.2	6.88	Pine Bluff [†]	70	10	37.3	2.98	Jolon [†]	69	25	43.2	6.17	San Jose [†]	75	37	50.7	1.11
Sturdevant [†]	67	16	36.6	2.70	Prescott [†]	67	13	36.7	3.14	Julian [†]	61	24	39.6	0.26	San Luis L. H. [†]	62	35	47.7	1.88
Tallapoosa Falls [†]	68	21	40.9	9.51	Rogers [†]	66	—14	30.2	2.71	Keeler [†]	62	28	45.3	1.65	San Mateo [†]	74	25	51.1	0.26
Tuscaloosa [†]	70	27	49.2	.....	Stuttgart [†]	66	—11	35.8	2.56	Keene [†]	64	32	45.9	2.25	San Miguel [†]	70	40	56.4	0.86
Tuscumbia [†]	64	10	34.5	8.00	Texarkana [†]	66	12	38.0	.....	Kennedy Gold Mine [†]	64	32	45.9	2.25	San Pedro [†]	78	35	54.8	1.23
Union Springs [†]	64	10	34.5	8.00	Washington [†]	66	12	38.0	.....	King City [†]	66	30	49.2	0.66	Santa Ana [†]	75	38	54.5	1.40
Valley Head [†]	70	21	45.3	10.75	Winslow [†]	59	—6	31.8	1.22	Kingsburg [†]	65	32	50.2	0.15	Santa Barbara L. H. [†]	72	31	53.0	1.04
Wiggins [†]	70	21	45.3	10.75	California.					Knights Landing [†]	71	32	48.5	1.75	Santa Clara [†]	67	36	52.7	1.33
Alaska.					Agnew [†]	70	32	48.3 ^d	0.77 ^d	La Grange [†]	69	33	50.8	0.50	Santa Cruz [†]	68	30	50.5	1.40
Juneau [†]	46	9	28.6	13.67	Aicade [†]	70	34	48.7	0.15	Lathrop [†]	70	32	51.1	0.56	Santa Cruz L. H. [†]	63	33	42.6	1.54
Metlakatla [†]	52	22	36.6	15.52	Aicatas Island [†]	61	40	50.0	2.18	Laurel [†]	72	31	48.3	2.96	Santa Margarita [†]	63	33	42.6	1.54
Arizona.					Almaden [†]	66	35	51.4	1.13	Lemoore [†]	69	30	47.2	0.25	Santa Monica [†]	70	35	53.0	1.11
Antelope Valley [†]	76	29	53.7	1.90	Alvarado [†]	74	34	55.2	1.78	Lime Point L. H. [†]	67	33	49.2	0.84	Santa Paula [†]	74	38	54.5	0.70
Ariz. Can. Co. Dam. [†]	70	20	45.6	0.40	Anaheim [†]	74	36	55.7	0.77	Livermore [†]	75	33	49.2	0.84	Selma [†]	65	31	49.5	3.43
Benson [†]	74	20	44.7	1.64	Angel Island [†]	73	23	48.6	2.06	Long Beach [†]	64	32	48.8	1.04	Seven Palms [†]	74	38	57.5	2.18
Bisbee [†]	66	23	45.2	1.41	Antioch [†]	60	36	49.5	1.38	Los Angeles [†]	74	32	51.3	.....	Shasta [†]	55	21	35.6	3.78
Buckeye [†]	66	23	45.2	1.41	Arcata [†]	65	30	50.9	0.92	Los Banos [†]	78	32	53.4	0.85	Shingle Springs [†]	70	32	51.9	2.55
Calabasas [†]	66	23	45.2	1.41	Athlone [†]	72	31	48.9	0.35	Los Gatos [†]	61	31	45.7	0.10	Sims [†]	56	20	35.5	1.12
Casa Grande [†]	66	23	45.2	1.41	Auburn [†]	74	35	50.2	4.00	Lodi [†]	60	35	48.0	1.76	Sisdon [†]	54	15	35.3	2.34
Chiricahua Mts. [†]	66	23	45.2	1.41	Bakersfield [†]	66	37	52.2	1.61	Mammoth Tank [†]	80	29							

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
California—Cont'd.	°	°	°	Ins.	Connecticut—Cont'd.	°	°	°	Ins.
Winters *1	70	32	52.1	2.77	South Manchester	.....	.....	.....	4.85
Woodland *1	60	36	44.4	2.05	Stevenson	.....	.....	.....	6.29
Yerba Buena L. H.	.....	.....	.....	2.21	Thompson *1	57	-3	25.2	.....
Yountville *	.....	33	.....	3.65	Voluntown	59	0	28.7	5.77
Yreka *	52	18	33.5	1.65	Wallingford	.....	.....	.....	6.41
Yuba City *	66	37	50.5	3.28	Waterbury	52	-7	24.2	6.01
Colorado.	.....	.....	.....	.....	West Simsbury	.....	.....	.....	5.18
Abbott	.....	.....	.....	0.40	Delaware.	.....	.....	.....	.....
Alma *	46	-14	17.8	0.37	Dover	66	8	33.2	4.89
Antonito	41	-20	13.6	.....	Kirkwood *	70	.....	29.0	.....
Apishapa *1	49	-8	27.0	0.40	Seaford	65	7	34.4	4.78
Arborea	.....	.....	.....	0.85	District of Columbia.	.....	.....	.....	.....
Avoca	.....	.....	.....	0.22	Dist'ing Reserv'r *	54	5	31.7	5.53
Box Elder	.....	.....	.....	0.60	Long Bridge	.....	.....	.....	4.79
Brush	.....	.....	.....	0.52	Rec'ing Reserv'r *	53	9	31.7	5.29
Burlington	60	-17	22.2	.....	Washington B'ks	62	9	34.0	4.99
Byers *	54	-22	21.8	0.76	West Washington	66	4	33.2	6.80
Carson *1	45	-25	7.4	0.98	Florida.	.....	.....	.....	.....
Castle Rock	60	-24	20.0	0.60	Amelia	72	30	51.7	3.20
Cheyenne Wells *1	63	-11	24.3	0.10	Archer	82	22	53.5	2.57
Climax *1	44	-30	11.8	2.80	Brookville	80	33	57.2	3.30
Colorado Springs	65	-13	28.2	0.30	De Land	79	22	56.4	.....
Como (near) *	46	-11	19.2	0.22	Eustis	80	30	57.0	3.31
Cope	48	-19	20.8	0.63	Federal Point	78	35	56.0	.....
Crook	60	-29	21.6	1.27	Fort Barrancas	79	24	50.9	10.63
Cumbres	49	-14	16.6	3.40	Fort Meade	80	22	57.4	1.25
Deer Trail	.....	.....	.....	0.35	Green Cove Sp'gs	77	25	53.7	3.44
Delta	47	-17	18.8	1.20	Homeland *	82	36	60.7	0.95
Dillon	.....	.....	.....	1.20	Hypoluxo *	80	44	65.0	0.29
Downing	51	-19	18.2	0.67	Manatee	73	29	50.4	5.57
Dumont	.....	.....	.....	0.27	Merritts Island	83	34	59.4	3.21
East Dale	.....	.....	.....	0.00	Myers	79	38	60.6	0.42
Fort Collins	61	-28	21.1	0.60	Ocala *	82	37	70.4	0.40
Fort Collins (near)	.....	.....	.....	0.52	Orange City	78	27	54.2	3.73
Fort Logan	62	-21	28.0	.....	Orlando	82	25	57.0	1.86
Fruita	47	-16	16.2	1.92	Pasadena	81	35	58.8	1.72
Gaynor	.....	.....	.....	0.76	St. Andrews Bay	82	27	56.9	4.30
Georgetown	52	-5	26.8	0.18	St. Francis B'ks	70	28	49.6	5.81
Glen Eyrie	60	-9	27.2	0.35	St. Petersburg	76	29	55.6	4.25
Gold Hill	.....	.....	.....	0.95	St. Petersburg	81	35	59.2	3.70
Greenhorn	57	-16	26.0	1.25	Tallahassee	72	27	48.0	6.35
Grover	58	-20	23.0	0.79	Tarpon Springs	81	34	57.2	3.57
Hugo *	52	-22	21.3	0.20	Georgia.	.....	.....	.....	.....
Husted	67	-30	25.6	0.22	Albany	71	26	47.0	3.61
Idaho Springs	60	-14	28.1	0.29	Allapaha	72	22	47.4	4.77
Jefferson *	45	-9	18.6	2.60	Americus	72	21	44.3	6.78
Julesburg	62	-32	21.8	0.78	Athens	66	19	40.1	9.57
Kirk	.....	.....	.....	0.30	Athens	67	18	39.3	11.82
Kit Carson	.....	.....	.....	0.05	Blakely	66	25	45.9	5.57
Lamar	71	-8	30.0	.....	Canton	.....	.....	.....	12.59
La Porte	.....	.....	.....	0.55	Columbus	65	26	39.8	6.07
Las Animas	66	-6	25.8	0.40	Cordele	68	30	47.4	5.72
Lavender	.....	.....	.....	1.05	Diamond	57	9	34.2	11.87
Lay	.....	.....	.....	1.57	Elberton	54	22	39.4	11.94
Le Roy *1	52	-18	18.8	0.80	Forsyth	72	26	44.2	9.59
Leslie	.....	.....	.....	0.98	Fort Gaines	71	20	43.7	4.05
Livermore	60	-25	24.1	0.70	Fort McPherson	67	19	35.8	9.55
Loveland	.....	.....	.....	0.77	Gillsville	62	23	41.2	8.28
Manhattan	.....	.....	.....	0.43	Hephzibah	66	28	45.2	5.28
Meeker	58	-27	18.0	3.08	Lithia Springs	72	25	43.8	6.38
Middle Box Elder	.....	.....	.....	0.47	Louisville	72	22	43.8	7.67
Minneapolis	.....	.....	.....	0.50	Marietta	64	17	36.9	10.66
Monte Vista	42	-25	9.0	0.59	Milledgeville	60	30	42.0	7.33
Moraine	53	-17	24.0	0.50	Millen	72	17	43.2	5.66
Pagoda (near)	43	-27	16.7	2.70	Monticello *	.....	.....	.....	38.9
Parachute	46	-14	18.7	0.72	Point Peter	62	30	40.0	11.20
Paradox	.....	.....	.....	1.57	Poultan	75	21	45.1	4.88
Plato	45	-36	10.6	1.60	Quitman	74	26	48.8	4.90
Red Cliff	.....	.....	.....	1.45	Quitman	76	24	52.5	6.00
Rico	.....	.....	.....	1.70	Rome	.....	.....	.....	10.64
Robb	61	-19	24.7	0.58	Rome	.....	.....	.....	11.69
Rocky Ford	68	-8	26.4	0.50	Thomasville	74	25	47.5	6.46
San Acacia	.....	.....	.....	0.35	Toccoa	65	17	40.5	8.95
Sanborn	.....	.....	.....	0.00	Union Point	65	30	41.3	5.15
San Luis	46	-25	14.8	0.70	Waynesborough	70	21	43.4	7.40
Sedgwick	.....	.....	.....	0.29	Idaho.	.....	.....	.....	.....
Sheridan Lake *1	67	-8	25.4	0.08	American Falls	39	-21	14.8	0.91
Smoky Hill Mine	67	-19	28.6	1.30	Boise Barracks	47	1	22.2	1.53
Stamford	.....	.....	.....	0.90	Elk City	41	-18	18.6	0.73
Steamboat Spring	42	-29	13.9	2.00	Era	41	-16	.....	2.51
Surface Creek	56	-9	24.0	1.32	Fort Sherman	39	-6	20.4	1.85
Table Rock	56	-21	32.2	0.37	Garden Valley	43	-25	12.2	2.00
T. S. Ranch	48	-6	21.9	1.32	Henrys Lake	42	-8	21.8	6.45
Thon	63	-19	25.8	0.11	Kootenai *1	42	-8	21.8	6.45
Twin Lakes	.....	.....	.....	0.36	Ruthburg *	36	6	24.3	1.45
Villa Grove	.....	.....	.....	0.24	Illinois.	.....	.....	.....	.....
Ward District	.....	.....	.....	1.84	Alton	.....	.....	.....	2.09
Watervale	.....	.....	.....	0.60	Aurora	52	-15	17.2	1.53
Wray	.....	.....	.....	0.30	Beardstown	.....	.....	.....	1.75
Yuma	.....	.....	.....	0.80	Beason *	54	-12	18.8	1.45
Connecticut.	.....	.....	.....	.....	Carlisle	50	-17	21.2	1.52
Canton	57	-4	26.2	5.06	Charleston	56	-18	20.3	1.13
Colchester	59	-1	27.5	4.76	Dixon	45	-16	16.4	2.22
Falls Village	.....	.....	.....	5.71	East Peoria	52	-12	20.8	0.96
Fort Trumbull	55	5	33.6	4.57	Ellsworth	56	-16	20.9	0.70
Hartford	.....	.....	.....	6.67	Fairmount	56	-14	20.0	1.65
Lake Konomoc	.....	.....	.....	7.01	Flora	60	-11	23.5	1.66
Lebanon	.....	.....	.....	5.67	Fort Sheridan	53	-7	18.2	0.48
Mansfield	58	-2	25.5	4.91	Golconda	62	3	27.1	1.07
New Hartford *	45	-9	19.5	5.53	Greenville	59	-13	21.1	2.62
New Hartford	.....	.....	.....	5.15	Griggsville	56	-7	21.4	2.05
N. Grosvenor Dale	59	0	27.5	5.38	Havana	51	-6	22.3	1.65
Norwalk	56	2	28.6	3.52	Hennepin	56	-14	13.9	1.20
Norwalk	54	-2	25.2	.....	Irishtown	.....	.....	.....	2.44
Southington	55	1	25.9	5.50	Jordans Grove	57	-8	23.7	1.07

Meteorological record of voluntary observers, &c.—Continued.

Stations.				Temperature. (Fahrenheit.)				Precip'n.	Stations.				Temperature. (Fahrenheit.)				Precip'n.
				Max.	Min.	Mean					Max.	Min.	Mean				
Illinois—Cont'd.									Iowa—Cont'd.								
Lanark *	46	-12	12.2	2.13	Hampton *	47	-27	12.3	0.43								
Louisville *	58	-12	20.9	2.19	Hawlock	43 ^d	-30 ^d	13.6 ^d	0.30								
Manchester *	52	-8	.....	.....	Hawk Eye	.....	.....	.....	0.85			
Martinsville *	56	-16	23.1	1.60	Hopeville	55	-26	16.7	1.61								
Mascoutah *	.....	-15	.....	2.70	Hopkinton	45	-18	16.0	1.74						
Mattoon	55	.....	26.3	1.20	Independence *	46	-19	14.5	0.61							
McLeansborough *	58	-10	24.9	1.43	Indianola	54	-28	18.4	1.21								
Mount Carmel	.....	.....	.....	2.40	Iowa City	51	-22	15.7	1.46					
New Haven	.....	.....	.....	1.42	Keosauqua	59	-18	20.0	1.40					
Olney *	57	-7	25.3	1.35	Larrabee *	42	-32	11.5	0.25								
Olney *	59	-11	23.6	1.61	Le Claire	.....	.....	.....	1.49					
Oswego *	54	-16	16.4	1.74	Logan	55	-29	18.7	0.90								
Ottawa	56	-15	20.3	1.45	McCausland *	42	-14	16.3	1.69								
Palestine	59	-14	22.9	1.15	Maquoketa *	44	-20	14.0	0.67								
Pana *	56	-1	24.6	2.11	Mason City	43	-29	12.6	2.20								
Peoria	.....	.....	.....	2.00	Maxon *	56	-30	16.0	0.69					
Peoriab *	52	-6	21.4	1.25	Mechanicsville *	48	-22	16.2	1.98								
Philoi	57	-25	18.7	1.69	Monticello *	46	-21	13.8	1.44								
Rantoul *	56	-12	18.2	0.90	Moor	55	-18	19.1	0.66								
Riley	50	-12	14.6	1.73	Mount Pleasant *	49	-20	16.4	0.45								
Rockford	48	-17	16.0	3.72	Mount Vernon *	46	-23	15.2	.....							
Rock Island Ars ¹ .	44	-12	14.4	1.31	Murray	55	-26	16.7	1.10								
Rushville	57	-6	18.7	2.07	Muscateine	49	-15	10.7	1.35								
Sandwich	62	-16	18.2	1.68	Osage *	.....	.....	.....	9.5					
Shawneetown	.....	.....	.....	1.11	Oskaloosa	53	-24	18.4	0.75					
Sycamore *	49	-12	16.7	1.73	Panama	52	-20	15.6	0.17								
Walnut	49	-13	17.8	2.30	Richland *	.....	.....	.....	12.6					
Warsaw	.....	.....	.....	1.20	Storm Lake	44	-38	14.1	0.37					
White Hall *	54	-5	18.4	1.75	Tipton	49	-18	16.4	0.57								
Winnebago *	42	-14	15.2	2.60	Vinton *	46	-24	14.4	0.85								
Indiana.									Washington								
Angola *	54	-7	22.7	1.58	Webster City *	48	-28	13.4	0.61								
Butlerville *	.....	-8	23.0	1.61	West Bend *	49	-31	13.4	0.35							
Columbia City	41	-16	19.0	1.39	Williams	45	-32	9.1	0.29								
Columbus	53	-14	23.5	1.83	Winterset	50	-24	17.4	0.95								
Connersville	56	-15	22.4	1.13	Kansas.									
De Gonia Springs	55	-5	27.5	2.04	Abilene	65	-19	27.2	0.60								
Delphi	52	-15	21.8	1.27	Allison *	64	-18	18.9	0.16								
Evansville	.....	.....	.....	2.09	Altona *	56	-13	22.8	2.25					
Farmiland	50	-14	24.1	2.04	Antelope	56	-22	24.4	0.47								
Franklin	49	-14	23.4	1.78	Atchison	55	-23	22.7	0.74								
Hammond	55	-12	19.8	1.07	Bucklin	.....	.....	.....	0.10					
Huntingburgh	58	-10	27.0	1.00	Buffalo Park *	75	-11	.....	0.30							
Huntington	.....	.....	.....	0.65	Burr Oak *	62	-21	.....	0.35				
Jeffersonville	57	-2	27.7	1.79	Cawker City *	68	-20	22.8	0.20								
La Fayette	56	-20	19.6	1.70	Collyer *	76	-10	.....	0.15							
Logansport	.....	.....	.....	1.30	Columbus	73	-16	32.2	1.98					
Logansport b	54	-12	23.8	0.84	Concordia	60	-35	21.2	0.51								
Marengo	62	-7	29.4	1.84	Cunningham	68	-13	26.4	0.08								
Marion	56	-22	21.4	1.41	Downs	.....	.....	.....	0.50					
Mauzy	52	-13	22.4	1.14	Elco *	64	-22	27.0	0.45								
Michigan City	50	-5	22.8	1.65	Elk Falls	58	-10	32.2	0.75								
Mount Vernon	.....	.....	.....	1.64	Emporia	61	-13	27.2	0.25					
Mount Vernon	54	-2	26.4	1.64	Englewood *	70	-8	31.6	0.04								
Point Isabel	50	-18	23.5	1.83	Eureka Ranch	71	-19	25.6	0.32								
Princeton	55	-8	24.9	1.60	Ft. Leavenworth *	55	-21	23.3	1.44								
Rockville	55	-12	21.0	1.77	Ft. Leavenworth b	57	-21	24.0	1.14								
Rushville	.....	.....	.....	1.41	Fort Riley	66	-25	23.9	0.40					
Seymour	54	-8	28.2	1.54	Fort Scott *	63	-21	.....	2.10							
Shelbyville *	53	-3	22.4	0.60	Gibeon	73	-18	26.7	0.20								
Terre Haute	56	-8	25.3	1.81	Globe *	60	-20	22.5	0.55								
Valparaiso	54	.....	.....	.....	Gove City *	74	-11	26.4	0.37					
Vevay	60	-4	26.8	2.43	Grainfield *	68	-12	.....	0.30							
Vincennes	.....	.....	.....	1.91	Grenola *	64	-15	26.4	1.70					
Worthington	57	-14	23.7	1.30	Grinnell *	70	-12	.....	0.47							
Indian Territory.									Halstead								
Eufaula	.....	.....	.....	0.62	Havensville *	62	-18	25.7	0.16					
Fort Supply	75	-13	32.8	.....	Horton	50	-33	22.3	0.90							
Headton	65	-12	39.5	0.65	Hutchinson	74	-13	31.0	0.30								
Parcell	75	-8	37.3	0.50	Independence	62	-16	28.3	1.46								
South McAlester	70	-1	50.6	0.85	Kansas City	58	-19	24.4	3.03								
Tulsa	.....	.....	.....	0.50	Kellogg	68	-20	28.4	0.65					
Iowa.									Kiowa								
Alta	46	-28	13.2	0.34	Kirwin	72	-11	33.4	0.13								
Amarna	49	-21	14.3	2.29	La Crosse	74	-12	26.3	0.30								
Ames *	50	-27	16.1	0.40	Lakin	72	-16	27.3	1.00								
Ames b	46	-34	12.6	1.00	Lawrence	58	-19	24.0	0.83								
Atlantic	58	-38	16.1	0.45	Lebo	65	-20	25.6	1.25								
Bancroft	45	-32	11.0	0.10	Leoti	72	-14	26.3	1.05								
Belle Plaine	52	-25	14.1	1.30	McAlister *	68	-14	.....	0.25							
Blakeville *	53	-26	15.0	1.02	Macksville *	75	-16	30.8	1.14								
Blackton	58	-30	17.8	0.50	McPherson	63	-18	25.8	0.14								
Bonaparte *	52	-18	19.4	1.85	Manhattan	.....	.....	.....	0.74					
Carroll	52	-27	16.2	0.45	Manhattan b	64	-26	22.2	0.76								
Cedar Falls	51	-32	11.9	0.47	Manhattan c	58	-23	20.6	0.61								
Cedar Rapids	50	-20	16.2	2.82	Medicine Lodge	.....	.....	.....	0.02					
Charles City	48	-26	11.6	0.59	Minneapolis *	58	-20	22.6	0.40								
Clarinda	57	-26	18.8	0.44	Monument *	64	-24	.....	0.30							
Clinton	48	-15	15.9	1.31	Morse	57	-21	22.5	3.05								
Corning	59	-31	17.8	1.35	Morton *	70	-12	28.8	0.25								
Corydon	57	-26	16.8	1.93	New Eng'd Ranch	70	-13	27.1	.....							
Cresco	44	-26	10.7	0.57	Oakley *	66	-12	29.6	0.25								
Dallas Centre *	.....	-28	14.1	0.50	Oberlin	.....	.....	.....	0.50				
Delaware *	.....	-32	9.5	1.63	Oswego	67	-18	32.5	0.45							
Eagle Grove *	.....	.....	.....	9.5	Page City *	66	-12	.....	0.08				
Elkader	49	-25	13.0	0.40	Pauline	59	-16	.....	0.40							
Fairfield	55	-20	18.8	3.13	Pleasant Dale *	59	-16	24.4	0.50								
Fayette	48	-26	13.1	0.98	Quinter *	70	-9	.....	0.15							
Fort Madison *	54	-15	23.0	2.17	Rome *	65	-14	28.4	.....							
Galva	59	-32	16.2	0.28	Salina *	50	-15	24.5	0.18								
Glenwood	76	-32	23.0	0.54	Sedan	65	-16	26.8	0.90								
Grand Meadow *	46	-22	13.6	1.07	Seneca	58	-34	19.5	0.66								
Greenfield	58	-27	15.6	0.73	Sharon Springs *	62	-8	.....	0.45							
Grinnell	51	-24	16.9	1.04	Shields	81	-10	32.2	0.03								
Grundy Centre *	48	-24	14.5	0.44	Tribune	68	-10	27.0	0.13								

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Kansas—Cont'd.					Maryland—Cont'd.				
Ulysses f.....	77	-3	30.6	0.73	McDonogh f.....	64	0	29.5	4.93
Wakefield f.....	61	-20	25.5	0.12	Mt. St. Marys Col f.....	95	8	29.6	5.32
Wa Keeney f.....	70	-10	27.4	0.20	New Market f.....	49	7	29.2	3.66
Wallace f.....	70	-11	27.4	0.13	Solomons f.....	66	10	31.8	5.09
Weskau f.....	70	-10	27.4	0.15	Taneytown f.....	61	0	30.0	4.58
Yates Centre f.....	64	-20	25.6	1.92	Massachusetts.				
Kentucky.					Adams f.....	60	-1	27.0	4.93
Bowling Green f.....	59	7	32.1	2.60	Amherst f.....	61	-10	25.2	5.41
Burnside f.....	59	4	32.7	0.95	Amherst Ex. St'n f.....	55	-10	25.3	5.05
Caddo f.....	56	4	32.7	0.62	Amherst Ex. St'n b. f.....	50	-2	23.8	2.40
Cattlettsburg f.....	57	5	30.5	1.11	Ashland f.....	57	-2	26.0	4.64
Canton f.....	55	-3	31.5	0.92	Blue Hill (sum't) f.....	57	2	27.0	5.06
Earlington f.....	60	8	30.2	2.42	Blue Hill (valley) f.....	57	2	27.0	5.06
Edmonton f.....	54	-5	22.2	1.32	Boston f.....	63	1	28.2	4.30
Falmouth f.....	63	6	31.5	2.78	Cambridge f.....	61	2	26.7	4.32
Frankfort f.....	63	6	31.5	2.78	Chestnut Hill f.....	62	1	28.0	4.45
Franklin f.....	63	6	31.5	2.78	Clinton f.....	62	-6	25.3	3.94
Greensburg f.....	61	5	28.6	2.02	Concord f.....	62	-6	25.3	3.94
Harrodsburg f.....	61	5	28.6	2.02	Cottuit f.....	55	1	29.8	2.99
Louisville f.....	62	6	32.9	6.46	Deerfield f.....	54	8	23.4	4.92
Middlesboro f.....	57	-6	25.2	0.62	Dudley f.....	58	-4	25.0	4.92
Newport Barracks f.....	62	6	32.9	6.46	Egg Rock, Nahant f.....	58	3	30.9	5.35
Paducah f.....	58	-6	26.9	1.66	Fall River f.....	58	3	30.9	5.35
Pellville f.....	58	-6	26.9	1.66	Fiskdale f.....	56	-2	24.1	4.71
Richmond f.....	50	4	29.2	5.57	Fitchburg f.....	56	-2	24.1	4.71
Shelbyville f.....	57	2	26.6	6.05	Fitchburg a f.....	60	-12	15.9	3.04
South Fork f.....	57	2	26.6	6.05	Florida f.....	56	-12	15.9	3.04
Springfield f.....	64	5	29.7	3.32	Fort Warren f.....	55	-11	24.2	3.00
Williamsburg f.....	57	2	26.6	6.05	Framingham f.....	59	-4	25.7	6.00
Louisiana.					Gilbertville f.....	59	-4	25.7	6.00
Abbeville f.....	79	24	48.9	6.58	Groton f.....	57	-4	25.7	6.00
Alexandria f.....	70	18	44.0	7.95	Hannibal f.....	55	-4	25.7	6.00
Amite City f.....	70	18	44.0	7.95	Hyannis f.....	55	-4	25.7	6.00
Baton Rouge f.....	70	18	44.0	7.95	Kendall Green f.....	58	-2	25.3	4.45
Cameron f.....	70	18	44.0	7.95	Lake Cochituate f.....	58	-2	25.3	4.45
Cheneyville f.....	70	18	44.0	7.95	Lawrence f.....	52	-6	23.0	4.92
Clinton f.....	73	20	45.6	5.85	Leicester f.....	52	-6	23.0	4.92
Coushatta f.....	73	20	45.6	5.85	Loominster f.....	50	-3	28.8	5.89
Coushatta f.....	73	20	45.6	5.85	Long Plain f.....	57	-4	26.5	5.38
Davis f.....	73	20	45.6	5.85	Lowell f.....	59	-6	24.0	4.92
Deoli f.....	73	20	45.6	5.85	Lowell f.....	59	-6	24.0	4.92
Donaldsonville f.....	74	24	48.0	6.60	Lowell f.....	59	-6	24.0	4.92
Edgard f.....	73	20	45.6	5.85	Ludlow f.....	54	-8	22.1	6.62
Emile f.....	73	20	45.6	5.85	Lynn f.....	59	3	27.3	5.58
Farmerville f.....	73	20	45.6	5.85	Mansfield f.....	59	3	27.3	5.58
Gilbertville f.....	73	20	45.6	5.85	Medford f.....	59	3	27.3	5.58
Grand f.....	70	11	40.6	2.40	Middleborough f.....	62	0	29.4	4.33
Grand Coteau f.....	72	24	47.2	4.54	Milton f.....	59	2	29.6	4.70
Houma f.....	75	24	46.7	8.87	Monroe f.....	54	-9	21.8	5.78
Jackson Barracks f.....	75	24	46.7	8.87	Mount Nonotek f.....	59	-9	24.8	5.15
Jeanerette f.....	75	24	46.7	8.87	Mystic Lake f.....	54	-4	25.0	4.50
La Fayette f.....	70	23	46.3	8.00	Nahant f.....	53	-4	29.0	4.35
Lake Charles f.....	74	10	43.6	4.62	New Bedford f.....	54	-5	29.6	4.35
Lawrence f.....	69	25	49.9	4.01	New Bedford b. f.....	59	0	31.0	4.33
Liberty Hill f.....	74	11	40.6	4.62	Northampton f.....	53	-1	29.8	5.93
Luling f.....	71	25	46.8	9.61	North Billerica f.....	61	0	27.1	4.00
Mandeville f.....	68	23	47.2	7.15	Plymouth f.....	54	4	31.8	3.79
Marksville f.....	76	20	43.4	7.08	Provincetown f.....	54	5	32.4	3.42
Maurepas f.....	72	24	47.1	5.52	Randolph f.....	51	3	29.6	4.93
Metairie f.....	75	21	46.3	2.15	Roberts Dam f.....	61	3	29.6	4.93
Minden f.....	71	16	40.3	5.79	Salem f.....	60	0	30.9	4.95
Monroe f.....	71	16	40.3	5.79	Somerset f.....	60	0	30.9	4.95
New Iberia f.....	74	24	46.7	5.80	South Hingham f.....	55	-3	24.8	4.99
N. La. Ex. Station f.....	71	12	38.4	4.74	Springfield Arm'y f.....	60	1	29.6	5.24
Paincourtville f.....	73	24	46.8	7.27	Taunton f.....	60	1	29.6	5.24
Plaquemine f.....	73	24	46.8	7.27	Taunton b. f.....	60	1	29.6	5.24
Roseland f.....	76	21	44.6	8.20	Taunton c. f.....	60	-1	29.0	4.93
Shell Beach f.....	69	20	45.3	5.29	Taunton d. f.....	60	0	28.2	5.77
Sugar Ex. Station f.....	73	26	48.8	7.15	Turners Falls f.....	55	-5	23.9	3.82
Thibodaux f.....	73	26	48.8	7.15	Wakefield f.....	61	0	26.2	3.82
West End f.....	73	9	39.6	7.35	Waltham f.....	60	-2	35.0	5.12
Winnabough f.....	73	9	39.6	7.35	Wellesley f.....	60	-2	35.0	5.12
Maine.					Westborough f.....	60	-4	26.5	5.04
Belfast f.....	50	1	22.8	5.65	Williamstown f.....	59	-8	33.2	2.68
Bethel f.....	48	-10	18.2	4.50	Winchester f.....	49	-4	24.9	4.49
Calais f.....	55	-4	24.0	5.30	Michigan.				
Cornish f.....	46	-1	21.5	5.09	Adrian f.....	54	-26	17.4	1.23
East Machias f.....	53	-6	23.6	5.19	Albion f.....	50	-14	22.3	1.91
Fairfield f.....	47	-15	18.1	3.38	Allegan f.....	54	-6	20.9	1.98
Farmington f.....	47	-14	17.8	5.45	Alma f.....	50	-16	17.4	2.48
Fort Preble f.....	50	5	27.4	3.13	Ann Arbor f.....	53	-8	18.6	1.31
Indian Stream f.....	37	-8	20.4	4.14	Arbela f.....	50	-10	10.2	2.10
Kennebec Arsenal f.....	47	-8	20.4	4.14	Atlantic f.....	36	-10	10.2	2.10
Kents Hill f.....	44	-8	18.4	4.88	Ball Mountain f.....	45	-11	17.8	1.23
Lewiston f.....	48	-8	20.8	5.52	Bear Lake f.....	46	-10	19.2	4.13
Orono f.....	52	-6	22.2	4.80	Bellaire f.....	44	-10	15.0	2.01
Petit Menan f.....	45	4	27.7	4.80	Bell Branch f.....	49	-16	20.4	0.82
West Jonesport f.....	48	2	26.8	4.80	Benton Harbor f.....	55	3	25.2	1.79
Maryland.					Bensonia f.....	45	-1	18.2	4.42
Barron Cr'k Spgs f.....	62	10	35.1	4.08	Berlin f.....	50	-12	18.3	1.33
Bootherville f.....	58	0	30.8	4.70	Birch Run f.....	57	-22	17.8	1.83
Bryantown f.....	66	5	32.3	4.03	Birmingham f.....	50	-20	20.7	0.86
Charlotte Hall f.....	66	3	31.0	4.03	Bronson f.....	51	-22	17.6	1.12
Cumberland f.....	52	5	30.0	3.18	Caldwell f.....	45	-7	16.4	2.70
Cumberland b. f.....	57	8	34.8	3.12	Calumet f.....	38	-6	11.9	3.09
Darlington f.....	57	7	27.9	3.50	Charlevoix f.....	43	3	20.3	3.95
Easton f.....	62	10	34.4	4.39	Cheboygan f.....	40	-18	13.3	1.72
Fallston f.....	57	11	29.7	6.54					
Fort McHenry f.....	60	10	32.8	3.71					
Frederick f.....	57	3	31.6	3.45					
Great Falls f.....	60	5	31.1	4.68					
Hagerstown f.....	56	8	31.2	4.06					
Jewell f.....	57	12	28.4	4.33					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Michigan—Cont'd.					Mississippi—Cont'd.				
Clinton.....	43	-25	16.2	0.55	Ship Island†.....	68	25	49.0	7.79
Concord.....	51	-18	18.9	0.93	Vaiden†.....	74	10	37.8	9.02
Crystal Falls.....	52	-25	8.4	0.70	Washington†.....	74	16 ^d	41.4 ^d	6.58
Eden.....	52	-12	19.7	1.56	Water Valley*.....	69	10	36.5	7.78
Fairview.....	52	1	20.4	1.15	Waynesborough a ¹	65	18	39.0	7.00
Fitchburg.....	52	-23	17.8	2.38	Yazoo City.....	65	18	39.0	7.51
Flint.....	53	-24	16.6	1.31	Missouri.				
Fort Brady.....	44	-27	12.2	2.30	Adrian†.....	60	-25	22.4	1.08
Fort Mackinac.....	42	0	16.0	2.63	Austin*.....	58	-15	25.5	0.85
Fort Wayne.....	52	-18	20.8	1.42	Boonville†.....	60	-21	23.8	1.10
Freemont.....	51	-10	17.5	1.51	Brunswick†.....	60	-21	23.8	1.10
Gladwin.....	40	-11	17.9	1.48	Carrollton†.....	55	-15	24.0	1.50
Grand Rapids*.....	49	1	23.3	2.77	Carthage†.....	62	-17	27.9	0.40
Grape.....	56	-18	30.6	0.78	Chillicothe a.....	60	-17	24.0	2.55
Grayling.....	45	-19	13.9	1.88	Conception†.....	59	-25	23.1	2.07
Hanover.....	52	-10	21.9	1.41	Darksville†.....	60	-20	24.0	2.70
Harbor Springs.....	44	-12	17.0	4.66	East Lynn*.....	59	-15	24.9	2.18
Harrison.....	45	-13	15.6	1.07	Eight Mile*.....	58	-18	25.7	2.02
Harrisville.....	41	-11	16.0	2.66	Eldon*.....	66	-11	26.6	0.70
Hart.....	50	2	31.0	3.60	Excelsior Springs*.....	58	-21	20.4	1.85
Hayes.....	55	-15	19.2	2.50	Fayette.....	64	-15	23.8	2.85
Highland Station.....	48	-19 ^d	17.0 ^d	1.66 ^d	Fox Creek*.....	60	-2	25.8	2.35
Hillsdale*.....	45	-16	19.6	0.44	Glasgow.....	62 ^k	-20 ^k	21.0 ^k	2.57
Howell.....	52	-23	17.5	1.74	Gordonville*†.....	59	-12	28.6	1.25
Hudson.....	52	-26	17.0	1.65	Harris*.....	47 ^e	-24 ^e	16.7 ^e	1.30
Ivan.....	46	-11	18.6	2.15	Hermann*†.....	61	-25	25.0	3.79
Jeddo.....	49	-9	18.1	1.30	Jefferson Barracks.....	61	-18	24.4	2.34
Kalamazoo.....	57	1	21.8	1.20	Jefferson City†.....	63	-10	24.4	2.34
Lansing.....	52	-12	19.8	1.05	Jerome.....	60	-27	22.4	2.32
Lathrop*.....	47	-20	10.8	2.46	Kidder.....	60	-27	22.4	0.50
McMillan.....	53	-24	18.1	1.37	Lamonte a.....	60	-27	22.4	2.26
Madison.....	53	-24	18.1	1.37	Lebanon.....	62	-6	28.8 ^k	1.80
Marshall.....	52	-13	19.6	1.35	Liberty.....	58	-18	22.9	1.25
May.....	52	4	17.2	2.02	Louisiana Bridge†.....	60	-10	26.8	1.11
Mio.....	46	-12	14.3	.....	Marble Hill.....	60	-10	26.8	2.00
Montague.....	51	2	20.2	.....	Mexico†.....	52	-11	21.8	1.69
Mottville.....	54	-22	19.6	0.64	Mine La Motte.....	67	-18	28.4	0.55
Noble.....	48	0	17.8	1.45	New Haven*.....	60	-8	33.8	3.50
North Marshall.....	50	-15	16.9	0.93	Oak Ridge*.....	65 ^d	-10 ^d	27.4 ^d	1.20
Olivet.....	47	8	17.6	.....	Oregon a.....	56	-26	21.4	1.08
Ovid.....	51	-13	17.9	1.63	Oregon b.....	57	-25	21.1	0.94
Parkville.....	.....	.....	.....	1.25	Phillipsburgh.....	.....	.....	.....	1.88
Paw Paw.....	53	-11	.....	1.92	Pickering*.....	50	-31	14.9	0.56
Rawsonville.....	52	-14	19.6	1.45	Platte River*.....	56	-22	18.0	1.00
Rockland.....	49	-20	10.6	.....	Princeton*.....	58	-25	21.4	1.10
Romeo.....	49	-8	19.3	.....	Rolla†.....	58	-2	24.9	2.29
Saint Ignace.....	39	-14	15.0	2.80	Saint Charles b.....	59	-11	22.3	1.72
Saint Johns.....	52	-5	19.6	1.60	Saint Joseph†.....	59	-21	23.1	2.58
Sand Beach.....	44	-7	15.6	6.27	Saint Louis.....	59	-21	23.1	1.52
Standish.....	56	-15	17.2	2.54	Sedalia.....	62	-19	22.8	3.09
Thornville.....	53	-20	20.0	1.41	Shelbina.....	60	-20	26.3	2.38
Vandalia.....	52	-9	20.9	1.87	Stellada.....	63	-16	27.1	2.30
Vienna.....	.....	.....	.....	1.40	Warrensburg*.....	61	-13	25.2	2.17
Washington.....	52	-20	19.4	1.00	Warrenton.....	54	-4	24.6	2.53
Weldon Creek.....	50	-20	17.8	4.43	Withers Mills*.....	56	-10	.....	1.70
White Pigeon*.....	50	-22	18.8	2.00	Zeitonia.....	.....	.....	.....	1.27
Ypsilanti.....	54	-8	20.7	1.68	Montana.				
Minnesota.					Camp Poplar River.....	41	-42	4.6	0.10
Albert Lea.....	43	-31	10.2	0.32	Fort Assinaboiné.....	56	-33	15.9	0.45
Alexandria.....	.....	.....	.....	0.18	Fort Custer.....	51	-28	20.6	1.31
Alma City†.....	45	-30	10.6	0.11	Fort Keogh.....	48	-28	9.3	0.36
Crookston†.....	41	-44	0.0	0.40	Fort Missoula.....	45	-15	19.5	1.59
Farmington*.....	44	-30	11.2	0.18	Nebraska.				
Fergus Falls a.....	.....	.....	.....	0.09	Agee*.....	.....	-22	16.0	.....
Fergus Falls b*.....	44	-40	.....	.....	Alliance†.....	54	-35	17.4	1.81
Fort Ripley†.....	.....	.....	.....	0.08	Anselty†.....	64	-42	19.0	2.20
Fort Snelling.....	47	-28	10.8	0.12	Auburn a*†.....	56	-35	18.6	1.02
Granite Falls.....	44	-37	9.8	.....	Bassett*.....	57	-30	18.2	0.92
Kimbria†.....	43	-35	7.9	0.82	Beatrice.....	59 ^d	-29 ^d	20.4 ^d	0.30
L. Winibigoshish*.....	45	-42	1.0	0.54	Belvidere*.....	72	-26	24.5	0.80
Leech Lake*.....	45	-42 ^d	1.3	0.35	Burwell*.....	39	-30	1.70	0.91
Mankato.....	54	-25	12.1	0.05	Croighton†.....	45	-32	14.3	0.40
Minneapolis*.....	43	-29	9.5	0.66	Crete.....	58	-32	18.8	0.78
Montevideo†.....	46	-35	9.0	0.48	Culbertson a†.....	.....	.....	.....	0.58
Morris.....	46	-35	6.2	0.20	De Soto.....	47	-33	16.9	0.40
Northfield†.....	44	-29	11.1	0.28	Dunning*.....	56 ^k	-16 ^k	21.5 ^k	.....
Ortonville.....	.....	.....	.....	0.50	Ericson*†.....	48	-25	16.8	0.95
Pine River*.....	40	-42	-2.8	0.22	Ewing*†.....	50	-29	15.9	0.43
Red Wing.....	46	-24	12.8	0.17	Fairbury*.....	57	-24	.....	1.08
Redwood Falls†.....	.....	.....	.....	0.18	Fort Niobrara.....	68	-34	17.4	0.20
Rolling Green†.....	42	-30	9.6	0.33	Fort Omaha.....	60	-29	19.1	0.33
Saint Charles*.....	45	-30	9.3	0.87	Fort Robinson.....	.....	-28	.....	1.56
Sheldon*.....	40	-29	8.5	0.59	Fort Sidney.....	60	-29	21.4	1.15
Mississippi.					Franklin.....	66	-22	22.2	0.35
Agricultural College.....	68	14	39.0	6.65	Freemont*.....	49	-31	17.2	0.50
Batesville†.....	72	8	47.6	3.80	Geneva.....	.....	.....	.....	0.60
Bay Saint Louis†.....	75	28	48.6	14.30	Genoa†.....	50	-35	17.1	0.30
Booneville†.....	64	13	36.4	4.58	Gering†.....	67	-24	23.4	1.31
Brookhaven†.....	74	10	41.6	6.99	Grand Island.....	57	-28	20.5	0.90
Canton†.....	71	17	40.2	5.20	Grant†.....	.....	.....	.....	1.90
Columbus a†.....	.....	.....	.....	5.50	Hartington†.....	45	-26	12.6	0.55
Duck Hill.....	68 ^d	9 ^d	37.4 ^d	3.34 ^d	Harvard*.....	53	-26	18.4	0.83
Edwards†.....	70	14	40.0	4.73	Hastings*†.....	56	-25	.....	1.20
Enterprise†.....	72	17	40.9	7.20	Hayes Centre.....	.....	.....	.....	1.48
Fayette†.....	71	16	43.8	6.11	Hay Springs†.....	54	-37	16.0	1.61
Greenville.....	65	14	37.6	5.59	Hebron.....	59	-28	21.3	0.70
Kosciusko†.....	70	13	39.5	6.50	Holdrege*.....	.....	-21	16.0	0.72
Logtown†.....	71	25	47.8	8.44	Imperial*.....	57	-25	24.4	0.35
Louisville†.....	76	9	40.5	6.31	Kennedy*†.....	65	-22	21.2	0.41
Mayersville†.....	71	13	37.1	6.10	Kimball†.....	66	-27	23.1	0.20
Natchez.....	74	18	42.8	3.60	Lexington†.....	54	-33	19.0	1.40
Okolona.....	68	20	39.8	5.86	Lincoln.....	58	-29	20.0	0.78
Palo Alto.....	68	12	39.6	7.35	Long Pine*.....	65	-26	.....	1.00
Pontotoc.....	65 ¹	8 ¹	35.6 ¹	3.50 ¹	Marquette*.....	50	-26	.....	0.85
Port Gibson†.....	72	14	39.2	5.20					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Nebraska—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>New Jersey—Cont'd.</i>	o	o	o	<i>Ins.</i>
Mayberry	58	-24	18.0	0.55	Camden	62	9	30.0	5.27
Minden	52	-32	18.2	0.21	Cape May C. H.†	59	9	30.6	3.33
Nebraska City 1*	46	-30	15.1	0.17	Deckerton†	59	0	25.6	5.90
Norfolk†	49	-39	16.7	0.80	Dover	59	-6	25.4	5.90
North Loup†	48	-40	13.9	0.43	Egg Harbor City†	61	4	31.5	5.26
Oakdale	50	-22	18.3	0.70	Elizabeth†	55	1	26.6	4.24
O'Neill†	48	-22	18.3	0.70	Franklinville	60	4	31.3	4.62
Ough b†	46†	-28†	13.9†	0.38	Freehold†	63	4	30.6	4.41
Palmer†	51	-39	13.6	2.16	Gillette†	63	2	27.3	3.41*
Pawlet†	51	-39	13.6	2.16	Hanover	59	-6	25.4	5.90
Plattsmouth†	64	-18	20.3	0.60	Highland Park†	62	1	28.1	5.57
Ravenna	50	-38	16.2	1.69	Imlaystown	62	5	30.6	4.50
Seward*	60	-25	19.4	0.40	Junction	59	0	28.2	5.75
Springview	60	-26	19.3	0.47	Lambertville	57	2	27.6	5.58
Syracuse*	58	-26	19.6	0.40	Locktown	61	7	29.4	5.04
Tecumseh	58	-30	20.7	1.00	Moorestown†	61	7	29.4	5.04
Tekamah	52†	-36†	12.4†	0.55†	Mount Holly	64	12	32.4	6.54
Thedford	54	-19	21.7	1.12	Newark	60	8	30.1	5.63
Wallace*	57	-30	18.4	1.11	New Brunswick a†	63	1	29.6	6.09
Weeping Water*	54	-30	18.4	1.11	New Brunswick b†	62	1	28.3	5.42
West Point*	47	-34	17.6	0.70	Newton†	60	2	25.6	5.26
Wilcox a†	54	-31	17.6	0.07	Ocean City*	53	14	34.3	3.80
Wilcox b†	54	-31	17.6	0.07	Oceanic	62	9	32.6	5.11
<i>Nebraska.</i>	43	8	27.4	0.63	Paterson	62	7	30.6	5.93
Battle Mountain*	45	3	25.3	0.32	Plainfield	61	4	29.4	6.18
Belleville†	41	12	27.3	0.10	Rancocas*	65	7	31.0	6.18
Belmont	47	7	28.2	0.30	Readington†	60	10	31.0	4.97
Beowawe*	43	10	19.2	0.80	Salem†	66	-9	31.6	4.10
Browns†	50	10	30.4	0.11	Somerville	66	-9	31.6	4.10
Carlin†	42	20	14.7	0.60	South Orange†	67	5	27.7	5.36
Carson City†	56	10	31.4	0.80	Tenafly	64	0	27.8	5.20
Crane Ranch	49	6	32.0	0.24	Trenton†	62	8	33.0	4.40
Downeyville	49	14	17.3	0.04	Vineland	61†	9†	32.6†	3.86†
Elko†	45	-24	14.1	0.60	<i>New Mexico.</i>	73	2	34.0	0.28
Ely	48	0	22.2	0.60	Albuquerque†	65	16	40.8	0.81
Eureka	55	3	28.8	0.35	Antelope Springs†	58	2	30.2	1.00
Farwell†	47	12	25.2	0.40	Bernalillo	59	-6	24.1	0.35
Genoa	53	2	25.4	0.40	Bloomfield†	59	-16	25.2	1.84
Goconda	40	-18	12.5	0.65	Chama†	70	-9	19.8	1.50
Halleck†	36	17	30.4	0.14	Coolidge	70	-11	30.4	0.45
Hawthorne b†	46	16	31.4	0.14	Deming†	70	-11	30.4	0.45
Hot Springs†	40	6	27.4	0.05	Dulce†	65	-32	15.4	1.12
Humboldt†	40	6	27.4	0.05	East Las Vegas†	65	-11	30.4	0.45
Lewers Ranch	54	15	38.6	0.60	Embudo	60	-3	29.7	1.55
Lowell†	50	12	31.2	0.30	Estalina Springs†	65	0	29.4	1.37
Mill City†	46	4	21.7	1.30	Folsom†	62	-11	28.8	0.91
Palisade†	45	-9	28.8	1.09	Fort Bayard	61	1	28.8	0.91
Palmetto	55	-1	28.8	1.09	Fort Marey	61	1	28.8	0.91
Pioche†	53	20	38.5	0.58	Fort Stanton	75	3	34.2	0.85
Reno State Univ.†	54	11	34.0	0.47	Fort Wingate	65	2	31.0	0.52
Saint Clair	54	12	32.0	0.43	Gallinas Spring†	64	3	33.5	0.42
South Camp†	56	-25	20.5	0.65	Halls Peak†	65	-20	26.2	0.55
Stofel	55	-25	20.5	0.65	Hillsborough†	68	8	38.7	0.79
Sunnyside	55	-4	19.7	0.25	La Luz†	76	15	46.8	0.67
Tecoma†	40	-4	19.7	0.25	Las Cruces†	76	4	39.4	0.50
Toano†	42	-10	21.7	2.77	Lordsburg†	78	13	39.4	1.75
Tuscarora†	73	5	30.9	0.11	Los Lunas†	75	3	33.5	1.23
Tybo	56	3	32.6	0.50	Monero†	54	-17	22.5	1.23
Verdi†	56	3	32.6	0.50	Olio†	45	-4	25.0	0.61
Virginia City	53	19	35.4	0.02	Pojuque	71	5	37.4	0.87
Wabaska†	50	4	28.7	0.00	Red Canyon†	72	12	41.2	0.90
Wadsworth†	36	4	23.0	0.45	Socorro†	66	18	37.6	0.30
Wells†	43	-10	20.3	0.45	Springer†	53	-14	21.2	0.96
Winnemucca	48	8	28.5	0.40	Taos†	65	5	33.6	0.82
<i>New Hampshire.</i>	49	-14	22.5	2.97	<i>New York.</i>	49	-14	22.5	2.97
Antrim	49	-14	22.5	2.97	Addison†	49	-14	22.5	2.97
Belmont	51	-24	14.8	4.48	Akron	50	-2	21.9	3.28
Berlin Falls	54	-22	16.6	4.65	Albion†	49	-2	21.9	3.28
Berlin Mills	48	-8	22.4	3.78	Alfred Centre†	44	-9	19.5	4.06
Concord a†	48	-8	19.0	3.78	Angela†	46	-22	19.0	3.27
Groveton†	40	-18	17.6	2.53†	Arcade†	45	-18	18.4	1.22
Hanover a†	51	-9	21.5	3.37	Au Sable Forks	45	-17	22.4	4.30
Hanover b†	51	-13	20.6	3.45	Baldwinsville†	49	-17	22.4	4.30
Lake Village	54	-15	17.5	3.99	Bedford	53	-17	22.3	4.21
Littleton†	53	-6	24.1	3.29	Binghamton†	53	-17	22.3	4.21
Manchester†	54	-6	24.1	3.29	Bloods Depot	53	-17	22.3	4.21
Mine Falls	57	-7	24.6	4.54	Bolivar	55	-3	27.5	5.59
Nashua	57	-7	24.6	4.54	Boyd's Corners†	42	-6	21.9	3.39
Newton	56	-2	24.2	4.35	Brookfield†	48	-28	19.1	3.94
North Conway	46	-8	19.3	5.72	Canton†	47	-30	17.0	2.87
Pennichuck Station	49	-17	18.7	4.26	Carmel†	55	0	25.4	6.12
Petersborough†	46	-10	18.6	5.01	Central Park, N. Y.	59	9	31.5	4.69
Plymouth†	48	-15	19.2	4.20	Chenango Forks	49	-17	22.4	4.30
Stratford	53	-12	19.4	4.55	Cherry Creek	45	-24	15.9	4.59
West Milan	58	-28	15.0	4.37	Constableville†	50	-18	20.3	4.99
Wiers Bridge	53	-28	15.0	4.37	Cooperstown†	50	-18	20.3	4.99
Wolfborough	53	-28	15.0	4.37	De Kalb Junction	52	5	29.2	5.30
<i>New Jersey.</i>	62	1	30.8	3.00	Demeter	51	-2	24.2	4.63
Allaire	57	5	31.0	4.45	Deposit†	51	-2	24.2	4.63
Asbury Park	57	5	31.0	4.45	Dunkirk b†	51	-2	24.2	4.63
Bayonne	57	5	31.0	4.45	Eden Centre	42	-16	22.0	0.16
Belleville	57	5	31.0	4.45	Eden Centre	42	-16	22.0	0.16
Belvidere	57	5	31.0	4.45	Elmira†	49	-13	23.5	3.01
Beverly†	59	-3	25.2	5.39	Factoryville†	48	-19	22.0	3.99
Blairstown	59	-3	25.2	5.39	Fleming†	49	-5	21.9	4.40
Bridgeton a	60	14	34.3	4.05	Fort Columbus	49	9	30.6	4.82
Bridgeton b	63	10	34.4	4.20	Fort Hamilton	60	8	28.6	4.63

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>New York—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>N. Dakota—Cont'd.</i>	o	o	o	<i>Ins.</i>
Fort Porter	54	2	23.1	4.12	Valley City†	41	-40	-0.7	.....
Fort Schuyler	58	8	29.8	7.06	Wahpeton†	39	-36	4.3	.....
Fort Wadsworth	59	5	30.2	6.23	Wild Rice†	.....	.....	1.4	0.32
Galway	50	-8	23.2	3.06	Willow City†	35	-52	-5.9	.....
Geneva†	45	-8	20.3	5.79	Woodbridge†	34	-47	-2.8	0.20
Glens Falls	45	-8	20.3	5.79	<i>Ohio.</i>	54	-8	23.6	2.35
Hess Road Stat'n†	53	0	22.7	3.23	Akron†	54	-8	23.6	2.35
Honeydew Brook†	57	-4	23.5	4.78	Ashland	52	-15	21.0	5.07
Humphrey†	45	-8	21.4	3.39	Athens†	58	-9	26.8	2.69
Ithaca†	52	-6	25.6	3.78	Bangorville†	51	-6	21.1	1.75
Jamestown *†	46	-16	22.8	5.41	Bellevue†	54	-12	20.6	2.00
Kings Station	46	-4	19.7	1.88	Bement†	54	-2	22.6	1.68
Le Roy†	46	-4	19.7	1.88	Caledonia†	54	-2	22.6	1.68
Liberty	54	-3	23.0	2.65	Canton†	56	-18	23.1	2.44
Lockport	54	-3	23.0	2.65	Carrollton	50	-18	21.0	2.02
Lowville	54	-3	23.0	2.65	Celina†	57	-11	25.9	1.27
Lyndonville	54	-3	23.0	2.65	Circleville†	57	-11	25.9	1.27
Lyon†	49	0	23.2	2.80	Clarksville†	54	-13	23.8	1.43
Lyon Mountain b	49	0	23.2	2.80	Cleveland†	54	-9	24.6	2.32
Madison Barracks	50	-31	19.7	2.78	Columbus Barracks	55	-11	21.2	1.91
Malone†	50	-13	15.5	6.24	Dayton†	55	-15	25.6	1.20
Middletown	58	0	23.6	4.21	Demon†	43†	-2†	24.8†	1.47†
Minnewaska†	54	-11	21.5	6.09	Elyria	52	-12	23.0	2.04
Mount Morris	53	-11	21.5	6.09	Findlay†	53	-19	21.7	1.44
Newark Valley	53	-11	21.5	6.09	Fostoria†	52	-11	23.2	1.73
New Lisbon†	51	-21	19.7	4.40	Garrettsville†	53	-26	20.4	2.50
N'th Hammond *†	48	-22	17.6	2.58	Georgetown†	54	-6	26.6	2.81
Number Four†	40	-23	14.8	6.58	Granville†	54	-18	23.8	1.92
Oxford	48	-24	19.7	6.47	Gratitot	54	-14	24.6	2.88
Pawling	45	-15	19.2	4.30	Greenfield	54	-10	25.0	1.25
Perry City†	45	-10	19.2	4.30	Greenville†	51	-17	22.8	1.07
Plattsburgh B'ks	45	-10	19.2	4.30	Hanging Rock†	58	3	28.4	3.22
Port Jervis	58	4	24.7	5.66	Harbor†	53	-12	25.1	2.89
Potsdam	47	-23	15.8	5.90	Jacksonborough	52	-2	24.0	0.85
Poughkeepsie	47	-12	24.2	5.35	Kenton†	54	-15	22.4	2.80
Quaker Street	58	-12	20.1	4.43	Logan†	58	9	26.4	2.62
Rome	44	-22	19.5	4.81	Lordstown†	55	-22	22.4	2.15
Romulus	49	-5	19.7	3.48	McArthur†	43	-9	25.3	1.87
Schockack Depot				3.95	Manfield†	.....	.....	2.54	.....
Setauket†	61	6	30.7	4.79	Marietta†	.....	.....	3.46	.....
Sherman†	47	-11	20.5	3.85	Marietta b†	61	1	29.7	3.27
South Canisteo†	47	-14	20.1	3.50	Marion†	53	-16	21.5	2.26
Southeast Reserv'r.				6.43	McConnelsville†	58	-9	26.0	2.37
South Kortright†	59	-12	20.8	3.30	Montpelier†	51	-25	19.2	1.54
Turin	44	-17	16.6	6.39	Napoleon†	53	-20	25.2	1.20
Utica	45	-26	19.6	5.74	New Alexandria†	58	-5	25.0	4.77
Victor	54	-1	22.4	2.34	New Comerstown†	57	-21	23.2	2.11
Wappingers Falls.				6.08	New Holland	53	-13	23.0	.....
Watkins	49	-12	24.4	.....	North Lewisburgh†	53	-13	23.4	1.00
West Chazy				3.29	Oberlin†	57	-16	21.7	2.76
West Point	55	-2	22.6	6.93	O. S. University†	55	-18	23.0	2.05
White Plains *†	45	6	28.0	1.50	Orangeville	51	-27	20.8	2.55
Willeys Point.	54	5	29.2	3.66	Piqua†	56	-17	21.0	4.02
<i>North Carolina.</i>					Pomeroy†	58	3	29.6	1.68
Asheville†	60	8	34.0	6.52	Portsmouth a†	.....	.....	2.71	.....
Bakersville†	60	2	31.8	4.64	Portsmouth b†	58	4	29.6	2.73
Bryson City†				8.33	Sidney†	.....	.....	1.64	.....
Chapel Hill†	68	14	35.9	6.22	Springborough.				1.34
Concord	68	16	38.2	11.50	Tiffin	55	-14	23.2	1.39
Currituck Inlet†				3.32†	Upper Sandusky†	48	-16	24.0	1.31
Douglas	63	9	36.5	9.80	Van Wert	53	-24	20.0	1.74
Fayetteville†				7.57	Wapakoneta†	52	-25	21.7	1.33
Hendersonville *†	57	12	34.1	6.72	Wauseon†	55	-23	19.2	1.42
Lenoir *†	68	14	35.8	5.40	Waverly†	57	-5	26.9	1.92
Lillington†				7.63	Waynesville†	54	-6	23.0	2.05
Linville†	58	4	32.4	1.89	Westerville†	53	-20	24.0	2.60
Littleton†	69	15	39.3	2.92	West Milton *†	52	-7	26.0	1.58
Louisburgh†	62	11	35.6	6.22	Weymouth	53	-26	21.0	2.20
Morgantown *†	67	12	36.5	6.71	Wheeler *†	.....	8	33.1	0.56
Mount Airy†	64	10	34.8	5.09	Wooster†	54	-20	21.5	2.50
Mount Holly†				7.11	Youngstown†	56	-16	25.2	1.78
Mount Pleasant†	67	17	37.2	7.92	Zanesville†	56	.....	.....	1.39
Murphy†				10.04	<i>Oklahoma Ter.</i>				
New Berne†	68	16	41.2	6.11	Barnet *†	60 ^b	-5 ^b	34.2 ^b	0.36 ^b
Oak Ridge†	65	13	36.6	6.07	Fort Reno	68 ^a	-10	30.9 ^a	.....
Pittsburgh	62	15	35.4	5.35	Fort Sill	72	-6	35.8	0.51
Salisbury†	63	19	38.4	6.63	Gate City†	75	-14	29.6	0.31
Saxon†	63	10	36.0	5.65	Guthrie†	67	-9	32.8	0.24
Southern Pines†	68	13	39.6	7.01	<i>Oregon.</i>				
Wadeville†	66	16	38.2	5.35	Albany a†	57	28	38.3	5.27
Weldon†	66	18	39.2	5.15	Albany b†	60	28	40.1	4.12
Wileyton	71	16	39.6	5.80	Ashland a *†	57	21	37.2	1.46
<i>North Dakota.</i>					Aurora *†	55	29	40.5	2.93
Ashley†	40 ^a	-38 ^a	6.9 ^a	.....	Bandon†	63	30	44.9	7.12
Carrington†	53	-40†	2.7	0.11	Brownsville *†	60	29	42.1	4.55
Dickinson†	45	-40	7.5	.....	Comstock†	56	27	39.0	4.21
Ellendale†	43	-36	10.8	0.24	Corvallis b *†	53	26	38.0	3.69
Fargo†	42	-35†	6.7	0.04	East Portland *	58	26	.....	4.35
Fort Buford	46	-40	3.9	0.10	Eola	54	22	37.6	4.20
Fort Pembina.	46	-41	-0.6	0.13	Grants Pass b *†	53	29	39.8	2.44
Fort Yates	50	-31	11.8	0.03	Junction City *†	50	28	37.2	2.69
Gallatin *†	38	-48	.....	0.24	La Fayette†	48	22	35.8	4.40
Grafton†	58	-38	-0.2	0.40	Leland *†	56	24	38.8	4.70
Grand Forks†	46	-38	1.2	0.35	McMinnville b *†	54	28	39.4	4.42
Grand Rapids†	39	-39	2.9	0.35	Monmouth *†	52	28	36.8	1.26
Hope†	37	-40	-0.6	0.45	Portland†	55	25	38.2	4.23
Jamestown†	54 ^a	-40 ^a	14.4 ^a	.....	Riddles *†	56	24	42.1	2.87
Kelso†	44	-40	4.8	0.42	Roseburg *†	60	31	43.2	3.58
Lakota†	36	-45	-5.5	.....	Salem†	57	28	40.7	4.01
Milton†	35	-41	-1.7	0.05	Sheridan *†	48	22	35.0	3.16
Minot†	42	-35	5.4	.....	Silverton *†	54	26	37.8	3.79
Napoleon†	38	-30	2.8	1.40	Siskiyou†	49	22	35.3	3.70
Power†	50	-36	6.2	0.19	Springfield *†	59	27	38.0	3.86
Saint John†	49	-38	0.8	0.50	West Fork *†	52	37	41.5	5.33
Saint Thomas†	43	-42	0.2	0.40					

Meteorological record of voluntary observers, &c.—Continued.

Temperature. (Fahrenheit.)					Precip'n.	Stations.	Temperature. (Fahrenheit.)					Precip'n.	Stations.	Temperature. (Fahrenheit.)					Precip'n.	Stations.			
Max.	Min.	Mean.		Max.			Min.	Mean.		Max.	Min.			Mean.		Max.	Min.	Mean.					
Pennsylvania.						S. Carolina—Cont'd.						Texas—Cont'd.						Washington—Cont'd.					
Allentown Arsenal.	60	0	26.3	3.64		Evergreen	65	20	41.8	9.82	Childress†	86	0	34.6	0.40	Chehalis†	56	27	39.4	3.22			
Altoona	55	-8	35.4	2.08	Greenville†	69	18	43.2	7.45	8.12	College Station	79	15	47.3	3.04	Chelan†	39	-	21.0	1.13			
Aqueduct ^a	55	-12	30.4	4.94	Kitching Mills†	69	18	43.2	7.45	7.45	Colorado b	79	15	47.3	3.04	Coele City†	43	-	21.0	1.13			
Bloomington ^a	56	-12	35.4	6.50	Nichols†	68	31	47.1	2.94	6.79	Columbia†	74	20	46.8	0.61	Doe Bay†	43	25	40.8	3.11			
Blue Knob	45	-12	20.5	5.41	Port Royal ^a †	68	19	36.7	4.97	2.94	Corsicana b†	70	10	39.4	2.65	East Sound†	53	20	40.0	2.79			
Brookville	45	-12	20.5	5.41	Simpsonville ^a	68	19	36.7	4.97	4.97	Cuerpo b†	77	20	47.2	1.06	Ellensburg†	53	13	32.9	0.05			
Brownsville	45	-12	20.5	5.41	Society Hill†	68	22	41.4	6.92	6.92	Durham†	77	20	47.2	1.06	Fort Canby	53	20	40.0	2.79			
Brownsville	45	-12	20.5	5.41	Statesburg†	68	25	42.2	6.65	6.65	Duval ^a	72	17	44.0	1.35	Fort Simcoe ^a	56	12	32.7	2.60			
Carlisle†	56	3	27.9	5.64	Tillers Ferry†	68	25	42.2	6.65	7.43	Forestburgh†	72	17	44.0	1.35	Fort Spokane	44	-6	32.4	1.22			
Clarion†	56	3	27.9	5.64	Trials	72	16	45.5	5.93	5.93	Fort Bliss	71	10	42.4	1.11	Fort Townsend	56	23	38.5	1.25			
Coatesville†	62	-1	37.4	6.76	Walshalla	65	19	40.8	5.45	5.45	Fort Brown	85	27	56.0	0.54	Fort Walla Walla	52	-3	32.0	3.3			
Confluence†	62	-1	37.4	6.76	Waterloo†	65	19	40.8	5.45	5.45	Fort Clark	78	11	45.3	0.40	Lapush†	52	22	41.4	2.7			
Coopersburg†	58	-1	27.0	6.98	Winnabow†	66	20	41.4	7.06	7.06	Fort Hancock	78	11	45.3	0.40	Madrone†	54	27	40.0	2.44			
Corry†	46	-28	30.4	2.79	Yorkville	67	21	39.0	9.00	9.00	Fort McIntosh	87	21	51.4	0.71	Pomeroy†	60	4	33.2	2.5			
Davis Island Dam†	66†	-1†	35.0†	4.93†							Fort Ringgold	90	16	52.7	0.75	Seattle†	63	27	41.5	2.61			
Drifton	66†	-1†	35.0†	4.93†							Friedricksburgh†	77	12	42.1	1.34	Sehome†	55	31	38.8	3.11			
DuBois†	58	3	26.2	8.46							Gainesville†	70	-1	38.4	0.65	Tacoma†	59	27	40.4	3.46			
Dyberry†	53	-8	21.4	5.15							Gallinas†	80	14	45.2	1.07	Vancouver B'ks	50	31	39.4	4.22			
Eagles Mere†	54	-8	22.3	6.19							Graham†	72	-3	39.0	0.21	Waterville†	47	-9	19.8	0.50			
Easton†	59	-2	26.2	5.30							Grape Vine†	74	9	40.2	2.04								
Edinborough ^a	43	-11	20.3	5.30							Hallettsville†	75	19	48.5	0.79								
Emporium†	47	-14	24.9	3.39							Hartley†	65	-	31.6	0.15								
Forks of Nehaminy†	47	-14	24.9	3.39							Haskell†	66	-	40.6	0.15								
Frankford Arsenal	62	5	30.0	4.85							Haymond	81	3	43.1	0.42								
Frederick	55	-12	30.4	4.94							Highland	81	3	43.1	0.42								
Freeport†	58	3	26.2	8.46							Houston†	73	20	45.3	1.78								
Girardville†	58	3	26.2	8.46							Kent	78	12	47.4	0.39								
Grampian Hills ^a	44	-10	21.9	3.49							Liano†	78	12	47.4	0.39								
Greensborough†	44	-10	21.9	3.49							Luling†	76	12	45.0	1.03								
Hamburgh	60	2	27.3	5.25							Menardville ^a †	76	7	39.8	0.57								
Hollidayburgh†	49	-8	26.0	3.51							Mequite†	72	5	40.1	1.62								
Honesdale	55	-3	23.5	5.32							Mountain Springs†	73	1	37.9	0.78								
Hulmeville	50	0	28.2	5.13							Nacogdoches†	89	10	47.2	1.76								
Huntingdon†	51	-2	27.2	4.22							New Braunfels†	74	18	47.8	2.03								
Johnstown†	51	-2	27.2	4.22							New Ulm†	77	15	45.4	2.21								
Kano	48	-9	31.8	5.11							Ochiltree†	77	15	45.4	2.21								
Kennett Square	62	6	28.2	5.82							Ocilla†	80	-8	40.4	0.50								
Kilmer†	52	6	31.5	4.81							Panther ^a †	72	6	41.7	0.87								
Lancaster	55	7	27.5	4.39							Quana†	70	-6	37.0	0.40								
Lansdale	55	7	27.5	4.39							Roby†	77	0	38.0	0.35								
Lebanon†	58	0	27.6	6.27							Round Rock†	72	16	44.6	1.46								
Le Roy†	48	-5	21.9	4.60							San Angelo†	77	6	40.3	0.32								
Ligonier†	55	-10	27.8	3.11							San Antonio a	78	19	47.2	1.51								
Lock Haven†	49	-3	26.9	4.86							San Antonio b	78	18	47.4	1.23								
Lock No. 4†	49	-3	26.9	4.86							Sierra Blanca a	77	5	40.0	0.00								
Maehoning†	54	4	28.7	4.25							Sierra Blanca b	74	-10	36.2	0.60								
McConnellsburgh†	54	4	28.7	4.25							Silver Falls†	74	-10	36.2	0.60								
Meadville	52	-18	23.8	4.25							Sugar Land†	76	27	49.8	2.30								
Meshoppen	52	-18	23.8	4.25							Temple†	71	10	40.2	2.20								
New Castle†	55	-20	35.2	2.75							Venus†	79	-6	39.7	2.13								
Oil City†	55	-20	35.2	2.75							Waco†	74	7	42.0	0.50								
Ottaville	55	-20	35.2	2.75							Wichita Falls†	77	2	36.9	0.40								
Parkers Landing†	55	-20	35.2	2.75																			
Philadelphia a	61	12	32.3	5.06																			
Philadelphia b	61	12	32.3	5.06																			
Philadelphia c	61	12	32.3	5.06																			
Phoenixville	61	-1	28.4	5.91																			
Pleasant Mount ^a	61	-1	28.4	5.91																			
Point Pleasant	61	-1	28.4	5.91																			
Pottstown†	60	3	28.7	6.46																			
Quakertown	60	3	28.7	6.46																			
Reading†	60	3	28.7	6.46																			
Ridgway†	60	3	28.7	6.46																			
Saegertown†	60	3	28.7	6.46																			
Salem Corners†	52	-11	30.9	7.34																			
Saltzburgh†	52	-11	30.9	7.34																			
Seisholtzville	52	-11	30.9	7.34																			
Selma Grove†	62	0	26.4	5.13																			
Smithport†	49	-22	30.4	5.13																			
Smiths Corners	49	-22	30.4	5.13																			
Somersett†	50	-8	24.3	3.05																			
South Eaton	56	-1	25.4	5.38																			
State College†	47	-3	24.8	3.98																			
Stoyestown†	47	-3	24.8	3.98																			
Swarthmore	60	6	29.8	4.20																			
Uniontown†	62	-9	30.0	4.34																			
Warren†	62	-9	30.0	4.34																			
Wellsbrough ^a †	45	-14	22.0	3.67																			
West Chester	60	8	29.3	5.80																			
West Newton†	60	8	29.3	5.80																			
Westtown†	60	8	29.3	5.80																			
Wilkes Barre†	61	3	27.5	7.02																			
Williamsport	61	3	27.5	7.02																			
Wyox†	57	-8	24.8	3.61																			
York	57	-8	24.8	3.61																			
Rhode Island.						Texas.						Virginia.						Washington.					
Bristol†	53	3	30.2	5.08																			
Fort Adams	55	1	32.4	2.92																			
Kingston a	57	-1	28.7	5.58																			
Kingston b	57	-1	28.7	5.58																			
Lonsdale	57	-3	29.0	5.30																			
Newport	56	2	32.4	4.43																			
Olneyville	63	4	31.6	4.43																			
Pawtucket	63	4	31.6	4.43																			
Providence a	63	4	31.6	4.43																			
Providence b	63	4	31.6	4.43																			
Providence c	63	4	31.6	4.43																			

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Wisconsin—Cont'd.	0	0	0	Ins.	Wyoming—Cont'd.	0	0	0	Ins.
Shawano.....	51	-20	15.4	1.56	Fort Yellowstone..	40	-22	16.4	1.40
Shell Lake.....	36	-33	0.6	0.14	La Barge.....	48	-42	1.1	0.31
Sparta.....	45	-27	11.9	1.82	Laramie.....	52	-29	20.2	0.08
Viroqua.....	46	-20	12.0	1.12	Lusk.....	54	-25	18.6	1.21
Waukesha.....	47	-23	12.1	1.65	Saratoga.....	55	-25	23.1	0.20
Westfield.....	47	-23	12.1	1.65	Sundance.....	50	-26	12.0	2.15
Weston.....	52	-24	10.1	0.48	Wheatland.....	58	-20	23.6	0.70
Whitehall.....	52	-24	12.6	0.15					
Wyoming.					Mexico.				
Bitter Creek.....	61	-31	25.0	.....	La Logia.....	83	40	62.3	0.04
Camp Pilot Butte..	45	-14	20.0	0.10	Leon de Aldamas..	74	34	55.7	0.16
Casper.....	72	-25	24.2	0.50	Puebla.....	72	32	54.3	0.55
Evanson.....	48	-22	20.8	0.40	Vera Cruz.....	79	59	69.0	0.03
Fort D. A. Russell.	62	-30	23.1	0.94	New Brunswick.				
Fort Fetterman.....	68	-44	21.0	0.90	Saint John.....	49	-4	24.6	8.36
Fort Laramie.....	64	-37	21.8	0.83	West Indies.				
Fort McKinney.....	60	-24	23.6	1.02	Grand Turk Island.	.....	.....	.....	0.76
Fort Washakie.....	57	-30	18.6	0.75	Hamilton, Bermuda	70	51	62.8	3.62

Reports received too late to be used in general discussion of weather for January, 1892.

Alaska.					Oregon—Cont'd.				
Killisnoo.....	44	12	31.0	8.40	Hood River (near) *1	45	12	34.2	4.45
Arkansas.					Hubbard.....	58	22	38.8	4.71
El Dorado.....	70	10	38.0	2.57	Jacksonville.....	60	25	38.8	2.02
Luna Landing.....	65	10	37.3	4.92	John Day Junction.	49	9	32.5	1.47
California.					Joseph.....	44	-7	19.4	2.32
Campo.....	.....	.....	.....	0.75	La Grande.....	48	1	26.9	1.12
National City.....	80	37	55.7	1.57	Lakeview.....	48	-2	28.0	2.01
Riverside.....	80	30	53.4	0.82	Langlois.....	60	32	46.4	9.96
Colorado.					Lone Rock.....	.....	.....	.....	0.91
Agate *1.....	68	-22	30.3	.....	McMinnville a.....	54	26	38.2	4.55
Idaho.					Mount Angel.....	58	25	39.3	5.16
Payette.....	46	-12	16.2	0.35	Newberg.....	54	26	38.9	4.71
Illinois.					New Bridge.....	52	0	25.6	1.04
Aurora.....	53	-14	18.0	2.30	Newport.....	54	35	45.1	7.00
Muddy Valley *1.....	54	-12	34.5	0.34	Pendleton.....	61	-8	32.4	2.25
Kansas.					Silver Lake.....	50	4	28.8	0.12
Coldwater.....	69	-13	29.6	0.20	Sparta.....	44	1	22.2	2.70
Weskauf.....	60	-12	25.6	0.22	The Dalles.....	51	18	34.1	1.35
Massachusetts.					Toledo.....	63	25	43.8	5.16
Newburyport.....	61	2	27.5	4.70	Vale.....	47	0	18.1	0.27
Michigan.					Vernonia *1.....	52	25	34.7	5.10
Berrien Springs *1	58	5	24.2	3.65	Weston.....	56	0	30.8	4.11
Montana.					Texas.				
Boulder Valley.....	47	-27	19.2	0.34	Dallas.....	82	-10	45.6	4.21
Choteau.....	61	-18	23.2	2.25	Huntsville.....	69	17	43.0	5.25
Cokedale.....	.....	.....	.....	1.70	Utah.				
Deer Lodge City.....	55	-18	19.9	1.26	Beaver.....	58	0	30.4	0.81
Glendive.....	50	-43	12.6	0.02	Cisco.....	54	-10	18.7	1.45
Great Falls.....	86	-20	32.6	0.68	Deseret.....	55	4	25.5	0.53
Livingston.....	.....	.....	.....	2.36	Green River.....	47	0	24.9	0.60
Martinsdale.....	47	-16	22.8	2.00	Grouse Creek.....	.....	.....	.....	0.54
Powder River.....	49	-46	13.8	0.64	Lake Park.....	47	0	23.3	1.70
Virginia City.....	49	-18	23.8	0.27	Levan.....	.....	.....	.....	1.29
North Carolina.					Loa.....	57	-8	25.4	0.35
Lexington.....	67	15	36.7	3.48	Loose.....	56	-5	24.6	1.70
Raleigh.....	65	17	41.0	5.45	Moab.....	50	3	25.7	1.20
Oregon.					Mount Carmel *1	52	2	30.0	1.09
Ashland.....	59	21	38.2	1.27	Nephi.....	43	-17	20.8	1.51
Arlington.....	51	13	32.6	0.74	Ogden.....	.....	.....	.....	1.82
Beulah.....	42	-11	17.6	0.90	Park City.....	.....	.....	.....	1.57
Burns.....	43	-10	20.7	1.05	Parowan.....	54	1	30.9	0.47
Canyon City.....	55	1	33.4	1.22	Richfield.....	53	2	26.4	1.28
Cascade Locks.....	48	26	37.1	9.89	Saint George.....	58	13	37.8	0.35
Corvallis.....	56	26	38.6	5.55	Snowville.....	37	4	23.0	0.32
Crook.....	47	3	23.7	1.40	Soldiers Summit.....	.....	.....	.....	21.1
Eugene.....	59	29	40.2	3.56	Stockton.....	49	2	24.8	0.13
Forest Grove.....	54	25	38.2	4.69	Thistle.....	.....	.....	.....	1.06
Gardiner.....	58	34	44.4	7.38	Washington.				
Glenora.....	.....	.....	.....	7.61	Vashon.....	58	26	39.7	1.06
Grants Pass.....	55	22	40.0	2.58	Mexico.				
Happy Valley.....	51	9	29.9	0.57	Mazatlan.....	80	53	66.6	3.10
Hardman *1.....	50	12	32.5	0.65	Mexico.....	71	36	54.1	0.00

Received too late for publication in December, 1891.

Alabama.					Arizona—Cont'd.				
Beesemer.....	68	19	47.0	4.03	Woodruff.....	.....	.....	.....	0.50
Florence (2).....	72	20	48.5	3.16	California.				
Jasper.....	69	17	45.6	0.12	Citrus.....	70	15	35.4	1.44
Mayaville.....	66	31	51.9	6.54	Julian.....	64	18	39.6	8.61
Mount Willing.....	73	28	51.8	4.60	Santa Maria.....	.....	.....	.....	2.77
Pittsboro.....	74	31	58.0	3.00	Colorado.				
Tuscaloosa.....	72	23	49.9	.....	Aspen.....	42	-11	18.4	4.20
Uniontown.....	74	25	52.9	4.61	Fort Collins.....	60	-10	28.6	0.46
Alaska.					Lamar.....	72	0	31.2	2.11
Killisnoo.....	41	8	31.3	5.20	Leslie.....	.....	.....	.....	1.53
Metlakatla.....	52	26	37.8	18.00	San Acacia.....	.....	.....	.....	1.60
Arizona.					Surface Creek.....	45	-6	25.8	2.07
Chiricahua Mts.....	.....	.....	.....	3.15	Illinois.				
Wilgus.....	.....	.....	.....	0.45	Chester.....	.....	.....	.....	2.08

Reports received too late, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Idaho.	0	0	0	Ins.	Nebraska.	0	0	0	Ins.
Clinton.....	54	0	32.7	2.64	Tecumseh.....	62	2	35.7	1.83
Galva.....	63	-8	33.9	2.31	North Carolina.				
Kansas.					Mount Pleasant.....	66	18	45.4	1.70
Garden City.....	.....	.....	.....	1.00	Raleigh.....	74	18	47.0	1.30
Medicine Lodge.....	.....	.....	.....	2.00	North Dakota.				
Michigan.					Dickinson.....	45	-8	24.9	.....
Berrien Springs (1)	56	16	36.8	2.30	Jamestown.....	.....	.....	.....	1.42
Mississippi.					Kelso.....	48	-20	18.3	1.09
Batesville.....	72	22	49.4	4.30	Texas.				
Mayersville.....	.....	.....	.....	55.5	Weatherford.....	74	20	51.2	2.14
Montana.					Wichita Falls.....	78	2	49.7	2.50
Boulder Valley.....	45	-19	22.4	0.13	Mexico.				
Choteau.....	54	-9	29.7	0.70	Leon de Aldamas..	73	38	56.8	0.55
Deer Lodge City.....	56	-19	25.0	0.10	Mazatlan.....	78	50	65.7	0.05
Glendive.....	51	-8	26.0	0.35	Mexico.....	71	36	50.4	0.12
Great Falls.....	63	-5	38.4	0.23	Topolobampo.....	75	48	58.4	0.00
Livingston.....	54	-5	27.4	T. 1	Vera Cruz.....	79	59	71.5	0.67
Martinsdale.....	49	-9	26.0	1.75					
Virginia City.....	46	-22	22.0	0.65					

*Extremes of temperature from observed readings of dry thermometer.

†Weather Bureau instruments.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

1 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.

2 Mean of 8 a. m. + 8 p. m. + 2.

3 Mean of 7 a. m. + 7 p. m. + 2.

4 Mean of 6 a. m. + 6 p. m. + 2.

5 Mean of 7 a. m. + 2 p. m. + 2.

*Mean from readings at various hours reduced to true daily mean by special tables.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

Italics following the name of a station, as "Livingston a," "Livingston b," indicate that two or more observers, as the case may be, are reporting from the same station.

Small Roman letters in figure columns indicate the number of days missing from the record; example, "4" four days missing, etc.

Data from Canadian stations for the month of January, 1892.

Station.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.	
	Inches.	Inches.	Inches.	°	°	Inches.	Inches.	
Saint John's, N. F.....	29.89	30.04	.....	31.2	+ 7.6	7.91	.....	no.
Sydney, N. S.....	29.92	29.98	+ .02	29.4	+ 9.9	7.21	+ 2.40	sw.
Anticosti, Gulf of St. L.....	.....	.....	.....	.....	.....	.....	.....	.....
Halifax, N. S.....	29.86	30.00	- .03	28.6	+ 7.6	6.27	+ 0.58	nw.
Grand Manan, N. B.....	29.92	29.97	.....	27.4	.....	7.86	+ 2.49	n.
Yarmouth, N. S.....	29.89	29.97	- .05	29.6	+ 4.1	9.02	+ 3.80	no.
Saint Andrews, N. B.....	29.91	29.96	.....	23.4	.....	8.01	+ 4.71	no.
Charlottetown, P. E. I.....	29.94	29.98	.....	26.4	.....	5.61	+ 2.30	n.
Chatham, N. B.....	29.98	30.00	- .02	15.6	+ 9.6	5.65	+ 2.37	w.
Father Point, Que.....	29.98	30.01	- .01	9.4	+ 3.4	2.88	+ 0.18	s.
Quebec, Que.....	29.66	30.03	- .04	12.2	+ 5.2	4.61	+ 0.94	n.
Montreal, Que.....	29.78	30.01	- .07	13.8	+ 3.8	4.68	+ 1.40	sw.
Rockliffe, Ont.....	29.44	29.94	- .13	7.5	+ 4.0	2.59	+ 0.58	nw.
Kingston, Ont.....	29.66	30.00	- .08	17.8	+ 2.8	3.22	+ 0.04	no.
Toronto, Ont.....	29.62	30.03	- .07	19.7	+ 0.7	1.58	+ 0.93	sw.
White River, Ont.....	28.58	30.07	.....	- 4.9	.....	0.09	.....	w.
Port Stanley, Ont.....	29.38	30.06	.....	19.6	.....	3.72	+ 1.04	w.
Saugeen, Ont.....	29.26	30.02	- .04	19.6	+ 1.1	4.41	+ 0.95	n.
Parry Sound, Ont.....	29.25	29.99	- .09	15.3	+ 3.8	7.21	+ 4.06	nw.
Port Arthur, Ont.....	29.29	30.06	- .04	1.0	+ 0.5	0.23	+ 0.58	w.
Winnipeg, Man.....	29.20	30.13	- .05	- 8.4	+ 2.6	0.53	+ 0.13	nw.
Minneapolis, Man.....	28.11	30.11	- .05	- 6.4	+ 5.1	0.27	+ 0.43	nw.
Qu'Appelle, Assiniboia.....	27.68	30.14	- .02	- 0.9	+ 7.1	0.50	+ 0.13	w.
Medicine Hat, Assiniboia.....	27.64	30.09	- .09	- 14.0	+ 12.5	0.16	+ 0.10	sw.
Swift Current, Assiniboia.....	27.38	30.16	- .02	6.6	+ 8.6	0.34	.....	w.
Calgary, Alberta.....	26.32	30.06	- .12	- 14.5	+ 11.0	0.03	.....	nw.
Prince Albert, Saskatch'n.....	28.40	30.18	.....	- 5.2	.....	0.38	.....	n.
Equimalt, B.C.....	30.06	30.11	- .02	39.4	- 2.7	4.95	- 0.27	n.
Stony Mountain, Man.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Moody, B.C.....	.....	30.03	+ .05	34.3	+ 6.6	8.05	- 0.76	nw.
St. Albans, Man.....	28.74	.....	- .03	- 7.4	+ 1.9	0.48	- 0.01	.....
Edmonton, Alberta.....	27.60	30.10	.....	9.6	.....	0.15	.....	nw.
Battleford, Saskatchewan.....	28.20	30.10	.....	- 2.5	.....	0.03	.....	w.
Grindstone, Gulf St. L.....	.....	.....	.....	.....	.....	.....	.....	.....
Hamilton, Bermuda.....	29.94	30.10	.....	62.4	.....	4.12	.....	sw.

Table of miscellaneous meteorological data for January, 1892—Weather Bureau observations.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.					Mean temperature data since opening of station.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean maximum.	Date.	Mean minimum.	Date.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.		Cloudless days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Table of miscellaneous meteorological data for January, 1892—Weather Bureau observations—Continued.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.					Mean temperature data since opening of station.									
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Date.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.		Cloudless days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.
																				Miles per hour.	Direction.								
Br. Northwest—Con.																													
Fort Buford.....	1,899	14	28.00	30.19	+ .02	8.2	+ 6.6	46	24 19	-40 18	-2 52	1	76	0.14	+ 0.4	6	5,969	W.	35	W.	21	10	14	7	4.7	21.2	1891	-5.6	1888
Upper Miss. Valley.																													
Minneapolis.....	758	22	29.28	30.18	.....	13.6	.....	47	* 24	-25 19	3 36	.....	69	0.05	.....	2	.....	W.	.....	.....	.....	18	9	4	.....	.....	.....	.....	.....
Red Wing.....	850	22	29.19	30.19	+ .04	10.0	.....	44	30 18	-28 19	4 33	4	77	0.02	+ 1.0	1	4,949	SW.	28	NW.	29 14	12	5	3	3.5	26.2	1880	-0.9	1888
Saint Paul.....	720	20	29.33	30.17	+ .06	14.3	+ 0.8	50	24 23	-20 19	6 31	.....	71	0.80	+ 0.5	13	4,898	N.	36	NW.	29 14	10	7	4	4.6	31.2	1880	2.6	1888
La Crosse.....	613	21	29.50	30.21	+ .06	16.0	+ 2.5	46	1 24	-12 19	9 38	.....	81	1.60	+ 0.1	9	6,617	SW.	34	NW.	1 12	12	7	4	4.6	37.6	1880	9.4	1875
Davenport.....	869	14	29.23	30.20	+ .02	17.8	+ 1.1	50	31 27	-26 19	9 36	.....	10	1.60	+ 0.2	7	5,978	NW.	40	NW.	1 17	9	28	3	3.4	36.2	1880	6.9	1888
Des Moines.....	651	19	29.42	30.17	+ .04	14.6	+ 1.9	46	31 23	-18 19	6 31	.....	75	2.34	+ 0.6	10	4,162	NW.	24	NW.	1 13	10	10	4	4.5	34.2	1880	6.6	1875
Dubuque.....	613	21	29.50	30.21	+ .06	19.6	+ 1.4	55	31 28	-16 19	11 31	.....	79	1.96	+ 0.3	6	5,221	NW.	32	W.	8 18	6	7	3	3.5	41.3	1880	13.6	1888
Keokuk.....	359	21	29.81	30.21	+ .01	29.3	.....	52	1 37	-7 20	21 30	.....	75	2.01	+ 2.1	7	7,129	NW.	38	S.	1 15	6	10	4	4.2	51.3	1880	25.4	1886
Cairo.....	644	13	29.46	30.18	+ .01	20.8	+ 4.8	57	1 29	-7 20	13 35	.....	76	1.14	+ 1.3	7	7,789	NW.	42	S.	1 13	7	11	4	4.7	43.7	1880	17.5	1888
Springfield, Ill.....	571	22	29.56	30.20	+ .04	25.9	+ 2.8	60	1 33	-1 20	18 34	.....	71	1.52	+ 0.2	8	9,969	NW.	43	NW.	2 14	9	8	4	4.4	45.7	1880	21.7	1881
Missouri Valley.																													
Columbia.....	963	4	29.16	30.25	.....	24.9	.....	63	31 37	-13 19	13 41	.....	72	2.27	.....	4	5,603	NW.	36	NW.	1 11	6	14	5	7	.....	.....	.....	.....
Kansas City.....	1,350	7	28.71	30.22	+ .05	25.6	.....	58	31 35	-17 19	10 32	.....	76	2.56	.....	6	5,301	NW.	34	NW.	6 15	9	7	4	4.0	34.0	1891	25.6	1892
Springfield, Mo.....	857	21	29.29	30.28	+ .08	23.9	+ 0.2	57	31 33	-20 19	15 36	.....	71	1.95	+ 1.0	7	6,055	NW.	34	N.	6 15	10	6	4	4.7	41.4	1880	14.4	1886
Leavenworth.....	1,158	5	29.00	30.25	.....	24.0	.....	60	28 36	-23 19	12 40	.....	77	1.21	.....	6	.....	N.	.....	.....	.....	13	14	4	.....	31.4	1891	17.5	1888
Topeka.....	1,113	22	29.00	30.25	+ .03	18.2	+ 1.0	57	31 26	-26 19	10 34	.....	77	0.42	+ 0.3	5	5,765	NW.	32	NW.	6 16	10	5	3	3.8	34.5	1880	7.3	1886
Omaha.....	2,613	7	27.35	30.26	.....	20.2	.....	58	31 32	-32 19	9 42	.....	73	0.78	.....	4	.....	NW.	.....	.....	.....	15	12	4	.....	29.4	1891	9.5	1888
Crete.....	1,470	.....	29.91	30.25	.....	19.6	+ 5.2	68	30 31	-24 18	8 60	.....	74	0.57	+ 0.0	6	6,781	W.	36	NW.	5 16	6	9	4	4.9	28.0	1891	7.1	1886
Valentine.....	1,158	.....	29.91	30.25	.....	14.7	.....	48	24 24	-28 19	6 34	.....	74	0.41	.....	8	6,656	NW.	36	S.	19 16	9	6	3	7	.....	.....	.....	.....
Sioux City.....	1,470	.....	28.55	30.23	.....	17.3	.....	54	24 28	-30 18	7 43	.....	78	0.10	.....	4	5,100	NW.	46	W.	27 12	10	9	4	3.5	.....	.....	.....	.....
Pierre.....	1,310	11	28.72	30.24	+ .03	10.4	+ 5.4	52	27 21	-34 18	0 40	.....	87	0.28	+ 0.2	10	9,556	NW.	56	S.	19 18	9	4	3	3.4	24.1	1891	1.4	1888
Huron.....	1,232	19	28.83	30.25	+ .05	14.2	+ 5.7	50	27 23	-32 19	5 45	.....	79	0.40	+ 0.2	7	6,488	NW.	38	SW.	21 17	5	9	3	3.9	28.9	1880	0.5	1875
Yankton.....	2,690	12	27.16	30.11	- .04	16.2	+ 9.5	56	29 27	-31 18	6 51	.....	9	0.19	+ 0.8	6	8,517	SW.	48	SW.	21 5	19	7	5	5.9	26.6	1891	-5.1	1890
Northern Slope.																													
Fort Assinaboine.....	2,374	.....	27.53	30.21	.....	13.3	.....	48	27 24	-45 18	2 45	.....	10	0.39	.....	6	3,556	S.	34	NW.	5 13	7	11	5	0	.....	.....	.....	.....
Miles City.....	4,118	12	25.81	30.22	+ .10	21.2	+ 5.9	62	29 28	-13 11	15 32	.....	12	1.02	+ 0.3	12	4,853	SW.	42	SW.	21 11	4	16	6	2	27.5	1891	5.3	1888
Helena.....	3,280	7	26.64	30.20	.....	21.7	+ 5.9	69	30 33	-25 18	11 56	.....	8	0.63	+ 0.3	7	6,009	W.	42	SW.	27 15	11	5	4	4.2	31.8	1891	10.7	1888
Rapid City.....	6,105	21	23.95	30.14	- .05	24.4	+ 0.6	62	30 35	-29 11	14 35	.....	11	0.99	+ 0.7	8	7,815	NW.	48	W.	19 13	14	4	4	4.0	31.3	1891	13.2	1875
Cheyenne.....	5,000	.....	24.63	30.32	.....	16.8	.....	57	30 31	-29 11	3 51	.....	5	0.73	.....	4	2,113	SW.	44	SW.	27 17	11	3	3	3	.....	.....	.....	.....
Lander.....	2,841	18	27.16	30.26	+ .04	17.4	+ 0.5	56	3 29	-26 12	6 45	.....	8	1.04	+ 0.6	8	5,299	W.	26	NW.	5 15	9	7	4	3.3	32.1	1890	7.7	1875
North Platte.....	5,287	21	24.73	30.29	+ .10	26.0	.....	64	30 38	-17 11	14 50	.....	10	0.40	+ 0.2	5	4,670	S.	36	NW.	4 14	11	6	4	4.1	35.9	1890	16.8	1875
Middle Slope.																													
Denver.....	4,734	4	25.27	30.23	.....	27.8	.....	71	30 40	-8 18	15 42	.....	12	0.10	.....	5	4,478	NW.	42	W.	4 15	13	3	4	4.0	31.2	1890	23.8	1891
Pueblo.....	1,410	7	28.70	30.30	.....	24.4	+ 3.0	62	31 36	-24 19	13 43	.....	77	0.53	+ 0.5	5	4,567	N.	36	S.	31 24	6	1	2	3.1	31.6	1891	10.5	1886
Concordia.....	2,523	18	27.49	30.25	+ .05	28.9	+ 5.3	71	30 41	-11 19	17 40	.....	15	0.25	+ 0.2	4	7,194	NW.	38	S.	31 16	11	4	3	3.6	38.1	1890	13.2	1875
Dodge City.....	1,360	4	28.72	30.26	.....	29.1	.....	64	24 40	-14 19	18 36	.....	17	0.31	.....	4	6,691	N.	40	N.	1 18	9	4	3	4.0	33.6	1891	29.1	1892
Wichita.....	1,239	.....	28.88	30.26	.....	33.0	.....	69	31 44	-11 19	22 35	.....	20	0.93	.....	2	7,096	N.	34	N.	18 16	8	7	3	3.9	.....	.....	.....	.....
Oklahoma City.....	1,748	7	28.35	30.22	+ .02	40.6	+ 0.1	73	4 50	2 19	31 33	.....	26	0.30	+ 0.6	3	8,870	S.	48	W.	1 15	10	6	3	3.5	49.8	1890	34.9	1896
Southern Slope.																													
Abilene.....	3,691	.....	26.32	30.24	.....	32.8	.....	68	30 44	-4 19	22 38	.....	19	0.42	.....	5	8,539	S.	46	S.	31 14	12	5	3	7	.....	.....	.....	.....
Amarillo.....	6,152	7	23.95	30.18	.....	35.6	+ 0.4	67	29 48	5 13	23 44	.....	1																



Chart I. Tracks of Areas of Low Pressure. January, 1892.



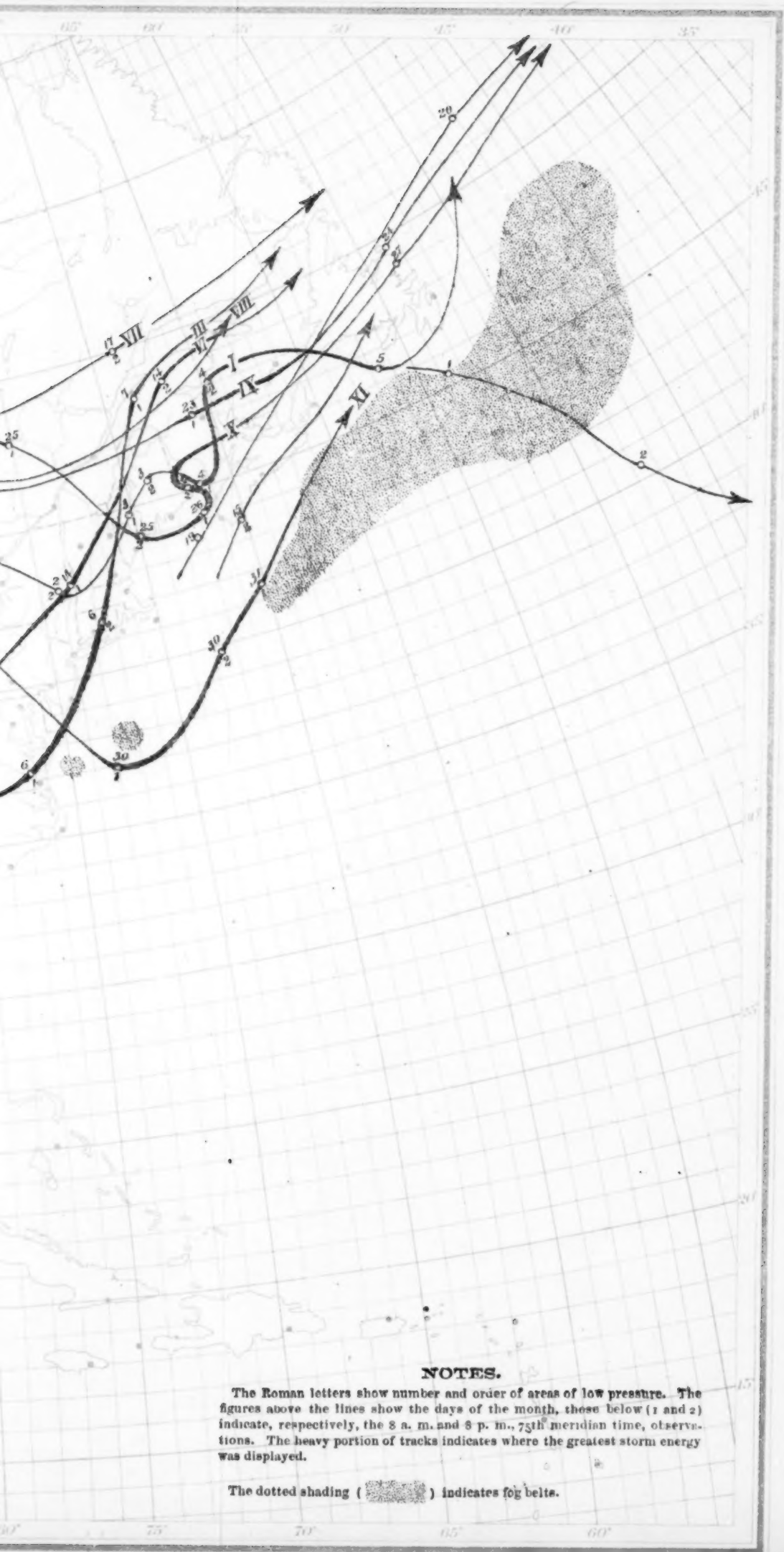




Chart II. Isobars, Isotherms, and Winds. January, 1892.

Figure 106 F

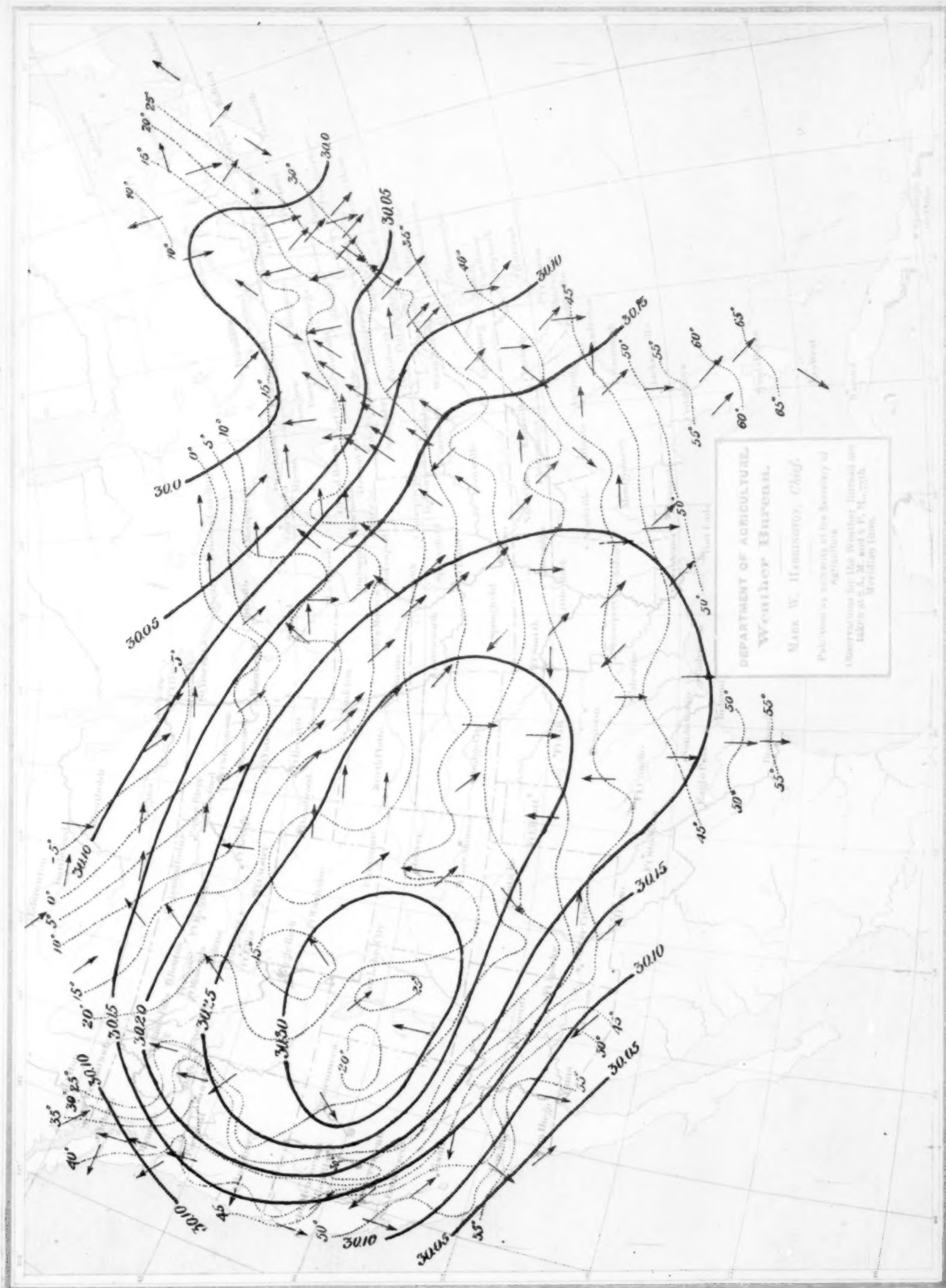
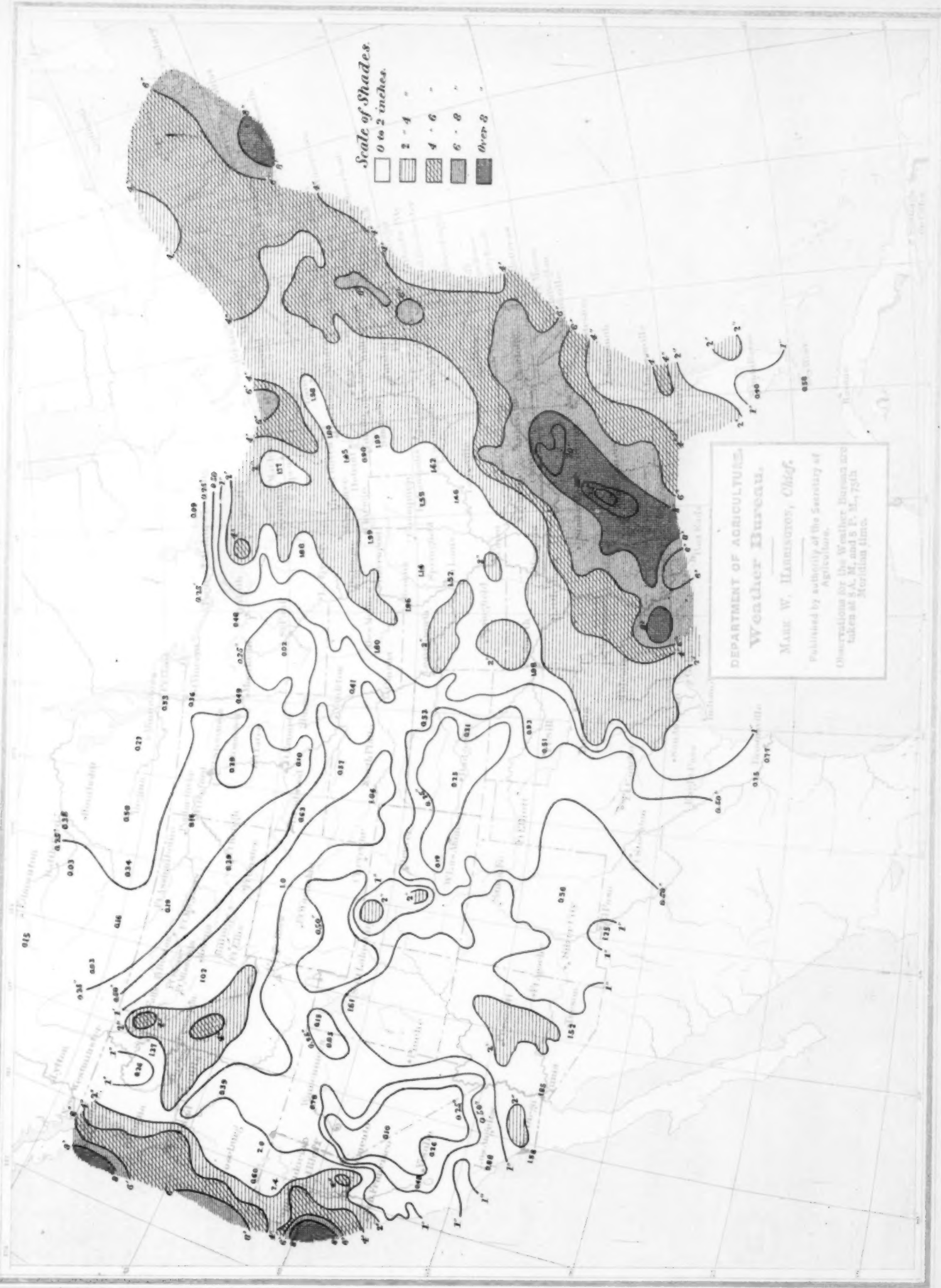
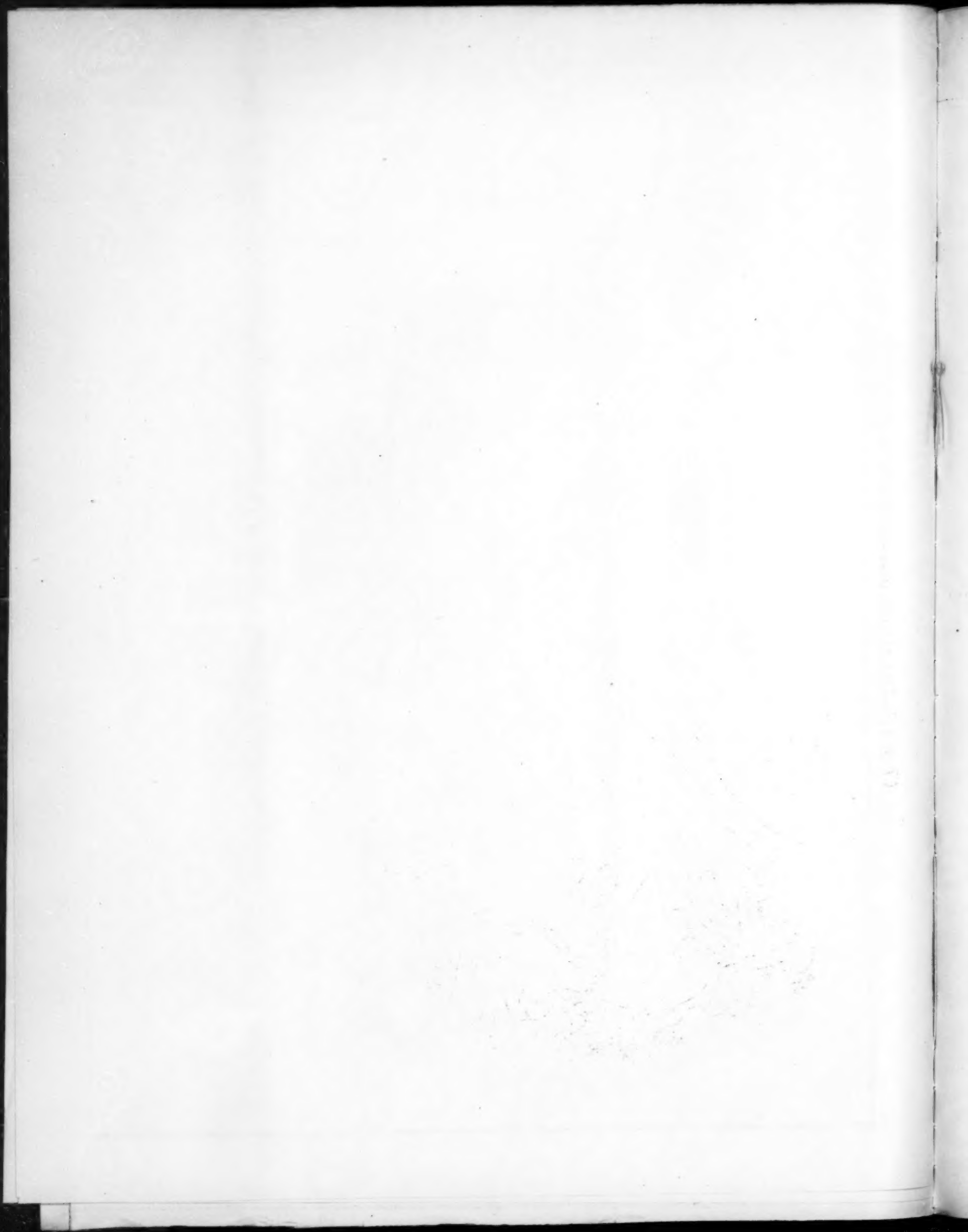


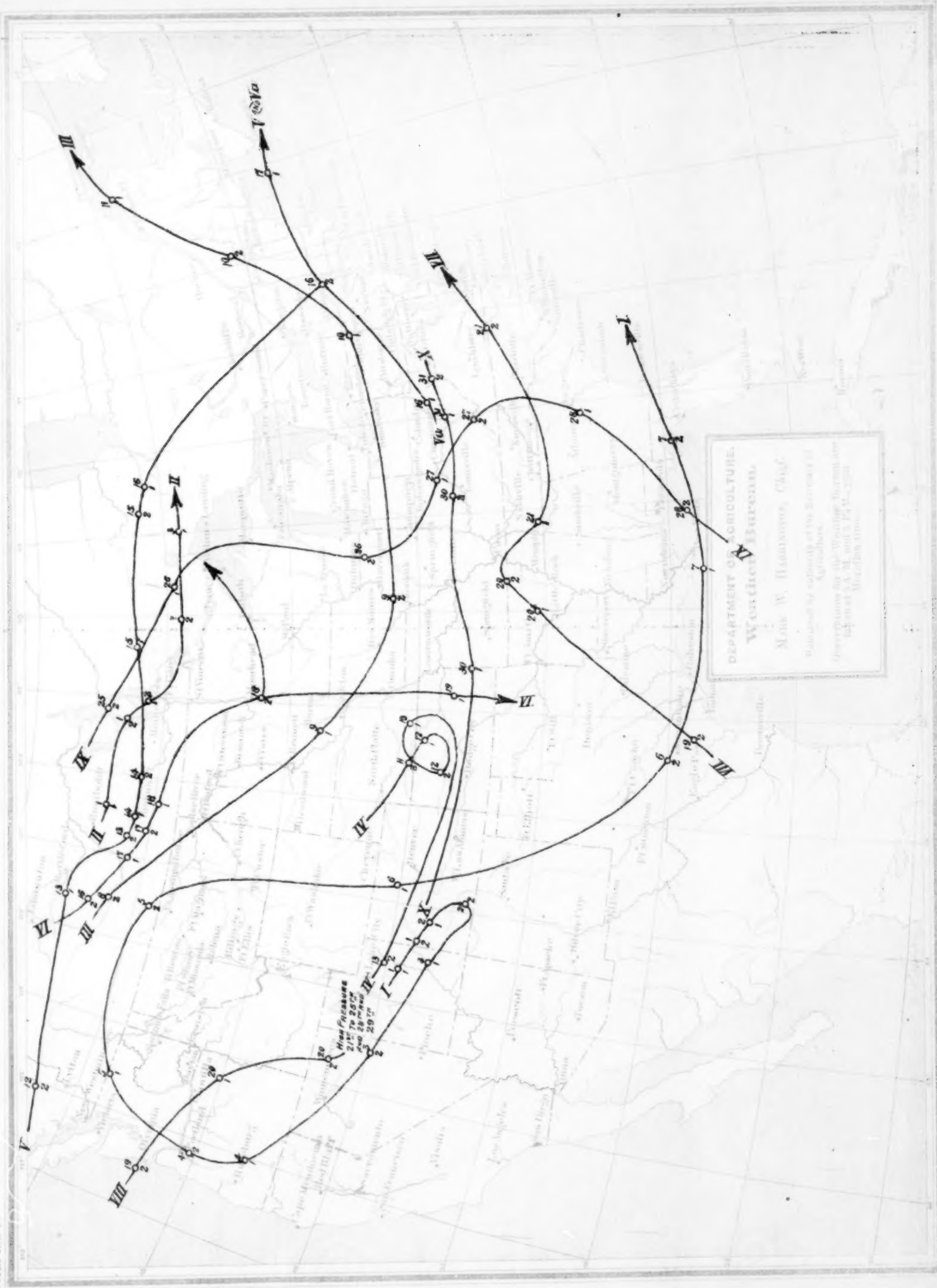


Chart III. Precipitation, January, 1892.





Perry, M. F.



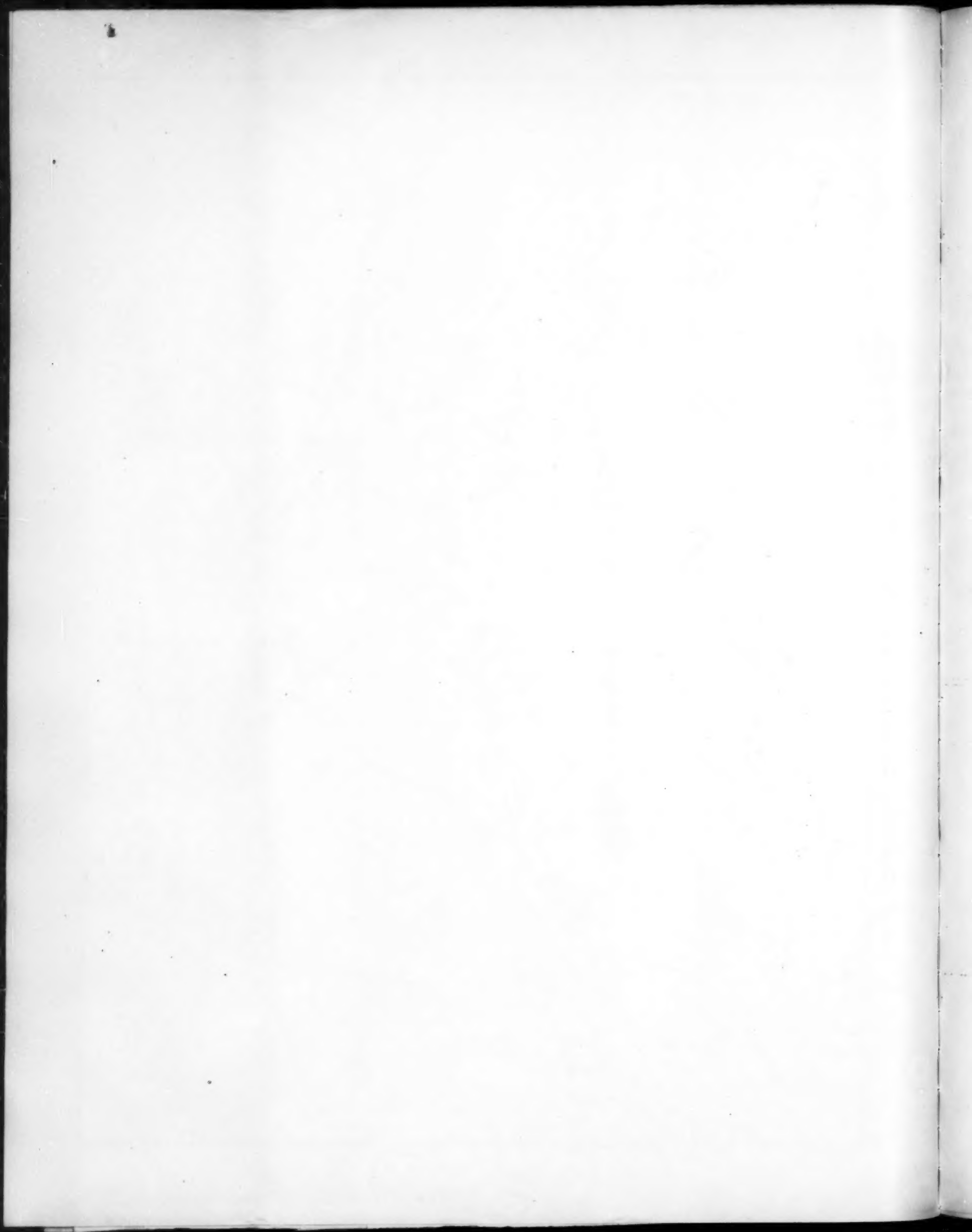


Chart V. Depth of Snowfall (inches) during January, 1892, and Limits of Freezing Weather.



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Chart VI. Depth of Snow (inches) reported on ground January 31, 1892.



Chart VII. Isobars, Isotherms, and Wind Directions at 8 p. m., January 18, and 8 a. m., January 19, 1892. (75th Meridian time).

